Co-funded by the Rights, Equality and Citizenship Programme of the European Union (2014-2020)

Projections of the Gender Pension Gap in Slovenia using DYPENSI

(project MIGAPE, Work Package 3)

Nataša Kump and Nada Stropnik

February 2021

This report is produced in the context of the MIGAPE (Mind the Gap in Pensions) research project. See www.migape.eu

MIGAPE is co-funded by the Rights, Equality and Citizenship Programme of the European Union (2014-2020) via Grant Agreement no. 820798. The content of this presentation represents the view of the author only and is his/her sole responsibility. The European Commission does not accept any responsibility for use that may be made of the information it contains.

Contents

1. Introduction

This note presents and discusses the projections of the gender pension gap (GPG) in Slovenia until 2070. The gender pension gap reflects how much women's pensions are lagging behind those of men.

Slovenia has a Bismarckian-style pension system, where the pension an individual receives at retirement is a function of his/her past career and earnings. Therefore, the GPG depends on the gender-specific labour market characteristics, such as the differences between men and women in part-time work spells, unemployment and withdrawals from the labour market, and the gender pay gap. These differences may be related to other gendered behaviour, and are the result and a part of cumulative inequalities the women face over their lives and in various economic, social or cultural domains.

The relation between the pay gap and differences in activity rates, on the one hand, and GPG later in life, on the other, is far from linear. It depends on many mediating aspects, including state transfers (primarily those related to parenthood) and especially the redistributive elements embedded in the first-tier pension systems (Dekkers and Van den Bosch, 2021).

The Institute for Economic Research (IER) participates in a European Union funded international research project called "Mind the Gap in Pensions" (MIGAPE).[1] The goal of the project is to analyse gender differences in pension income from various perspectives and communicate the lessons learned to policymakers and the audience at large. This project is collaboration between researchers from CEPS, the Federal Planning Bureau and the KU Leuven in Belgium, the University of Lisbon, Portugal, the IER in Slovenia and LISER in Luxembourg. A summary of the project and the project description can be found on the MIGAPE website (2021) (Dekkers, Hoorens and Van den Bosch, 2019).

This project aims to:

1. Use standard simulation techniques to provide information on the consequences of labour market decisions in the various stages of life on the future pensions of women;

2. Use dynamic microsimulation techniques to estimate the impact of various factors on future GPGs for the population as a whole; and

3. Assess psychological factors that may affect (women's) employment decisions through an on-line survey and some laboratory experimentation. (Dekkers and Van den Bosch, 2021)

In a previous note that covered the first goal of the MIGAPE project for Slovenia, Kump and Stropnik (2020) reported on the results of standard simulations. The first conclusion was that the existing child-related provisions in the pension system and the family policy alleviate the negative consequences of part-time work or full career interruption due to caring for a young child. Namely, maternity and parental leave do not have any impact on the future old-age pension because the person on leave receives earnings compensation that is equal to her/his average monthly gross earnings during the 12

[1] This project is funded by the European Union's Rights, Equality and Citizenship Programme (Grant Agreement number: 820798 — MIGAPE — REC-AG-2017/REC-RGEN-PENS-AG-2017).

months before the start of the leave. Also, the person working part-time does not lose any pension qualifying period in the first three years after childbirth. However, a lower basis for social security contributions for the difference to the full-time working hours in the second and third year (usually negligibly) negatively affects her/his pension assessment base.

The second conclusion was that a six-year career interruption causes a significant pension loss, regardless of the reason for interruption. The effect of the wage penalty[2] is strongest in the case of high-educated women because of their steep earnings profile (compared with flatter ones in the cases of low- and medium-educated women). Low-educated women benefit from the minimum pension assessment base that limits the impact of their foregone earnings and the loss in the old-age pension.

The third conclusion was that a low-educated woman with a continuous career can accumulate higher accrual rates (for working over 40 years) for three years, and a high-educated woman for only one, if retiring at the statutory retirement age. The simulations have shown that the impact of these very generous accrual rates on the old-age pension amount (for a low-educated woman) exceeds the impact of higher earnings and the resulting higher pension assessment base (for a high-educated woman).

These conclusions are based on standard simulations, also known as hypothetical or model person simulations. For the second goal of the MIGAPE project, we made projections of the GPG and assessed how it changes with varying career patterns and lengths. This is the subject of the current note that describes projections of the future GPGs using the Slovenian dynamic microsimulation model DYPENSI, and attempts to explain the underlying patterns behind these results. Apart from the standard definition of the GPG, we use several variants that help understand the development of the GPG. The simulations using the dynamic microsimulation model are based on the projections of employment rates by age and labour productivity growth (used for salary increases) made by the Ageing Working Group of the EU Council's Economic Policy Committee (henceforth: AWG 2021).[3]

The note is structured as follows. In the second section, we discuss the standard definition of the GPG and its variants, as well as the dynamic microsimulation model DYPENSI and the data it uses. In section three, we sketch the Slovenian socio-economic context in which the current GPG has arisen and which determines the future GPG, focusing on labour market differences between women and men. Section four presents the results for the base scenario. In section five, we show what happens to the GPG if we include zero pensions or if survivors' pensions are left out. In section six, we explore the impact of four different scenarios on the future GPG: 1) activity and unemployment rates, by gender and age group, are kept at their 2021 levels; 2) activity, unemployment, employment and disability rates, by age group, are set at equal levels for women and men, 3) besides equal activity, unemployment, employment and disability rates, salaries are set equal for women and men, and 4) pension legislation from 2019 is still in force. Section seven concludes.

[2] "Wage penalty" is a possible effect caused by periods of unemployment or full work interruption, which can imply that when returning to work, the person does not earn the same salary as an otherwise similar individual who worked continuously.

[3] The Ageing Working Group of the EU Council's Economic Policy Committee used these projections for the 2021 Ageing Report (European Commission, 2020), which includes the projections of the Slovenian pension system's financial and social sustainability .

2. Definitions, method and data

The GPG is often measured as one minus the ratio of the average pensions of women and men. In the measure of the GPG, as published by the Eurostat and based on the European Union Statistics on Income and Living Conditions (EU-SILC), pensions include gross old-age pensions, gross survivors' pensions[4] and (for Slovenia) gross disability pensions. People with zero pensions and those below the age of 65 are excluded from the calculation. However, this is not the only possible measure of the GPG. In a general form, the GPG(l, x) can be written as $1 - \frac{l(x)_f}{l(x)_m}$; usually, l is the mean of the variable of interest, x, e.g. gross old-age income, though l can be any measure of location (Dekkers and Van den Bosch, 2021).

The GPG variants can be distinguished according to four dimensions. First, x can include only old-age pensions, all old-age-, disability- and survivors' pensions, or any combination of these pension types.[5] Second, the standard GPG does not take into account zero-value pensions. Namely, one may argue that those who do not have a pension (i.e. the pension equals 0) are not retired. However, it can nevertheless be interesting to compare the GPGs with and without zero-pension values in some cases. The GPG that includes zero pensions can be seen as a combination of the standard GPG and the pension coverage gap. It measures the extent to which women have independent access to pension system benefits. Third, l can be any measure of location (percentile, decile). In this report, we focus on the mean and the 25th percentile. Finally, in addition to the GPG for pensioners aged 65+, we present breakdowns by age groups 65-74 and 75+.[6] Furthermore, the GPG is calculated for the whole group of pensioners, irrespective of age. Finally, it is interesting to look at the GPG of people in the year when they retire (Dekkers and Van den Bosch, 2021).

DYPENSI is a dynamic pension microsimulation model designed to address future pensions, allowing the assessment of both the future pension expenditures and the adequacy of pensions under various reform proposals. The first version of DYPENSI was built in 2011-2014 in the framework of the "Development of Dynamic Microsimulation Model for Slovenia" project (funded by the Slovenian Research Agency). Within the current (2018-2022) project ("Upgrading Analytical Models in the Field of the Pension System", funded by the European Social Fund), the model is updated, refined and extended. The starting population for DYPENSI is an administrative database merged from various sources. The first model version used the 2007 administrative data records constituting a 5% sample representative of the Slovenian population; the population is currently being updated to the 2017 administrative data and extended to a 20% sample of the Slovenian population. The new database based on the 2017 administrative data is not yet available for use. The currently running version of the model is an intermediate one between the first and the second DYPENSI version. Its main characteristics are as follows:

- The model uses merged 2007 administrative datasets as its starting population.

[4] The term "survivors' pensions" refers to both widows'/widowers' pensions and survivors' pensions (widows/widowers and dependent children are eligible).

[5] We mainly refer to: a) old-age and disability pensions, which are named "retirement benefits" and denoted GPG(l, rb) in this report, and b) old-age, disability and survivors' pensions, which are named "retirement benefits-survivors' benefits" and denoted GPG(l, rbsb).

[6] The Eurostat publishes GPGs for persons aged 65+, 65-74 and 65-79 (https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_pnp13).

- All demographic processes in DYPENSI are based on the baseline assumptions of the 2019 Europop release.[7]
- The activity rates, unemployment rates and economic growth assumptions are based on the AWG 2021 projections.
- Labour force transitions are based on the 2007 data.
- Pension (and other) legislation as of 2020 is modelled.

DYPENSI is implemented in Modgen, a freely available microsimulation programming language developed and maintained by Statistics Canada. DYPENSI is a continuous-time model, which means that realistic sub-annual spell durations of processes are supported. The processes can be:

- Continuous-time events that can occur at any time in a year and may lead to spells of any length. Examples are births followed by the maternity- and parental leave, labour market transitions, salaries, unemployment- and associated benefits following specific duration schedules, retirement, death, and survivors' pensions for a spouse and dependent children.
- Monthly events (mid-month or end-of-the-month) occur once per month. Typical examples are retirement decisions (requiring the calculation of potential pensions and eligibility) and continuous checks of eligibility for specific benefits, like survivors' pensions (e.g. those of dependent children reaching independence). Most alignment routines also operate on a monthly basis.
- Annual events (mid-year or end-of-the-year) occur only once per year. Examples are an (optional) alignment of salaries, some cross-imputations of income components not modelled longitudinally, the calculation of taxes, and the calculation of poverty measures.

Persons living abroad and currently receiving a Slovenian pension are not included in the 2007 administrative database of Slovenian residents that is used as a starting population. As they receive pensions, data do exist and were made available on an aggregate level. We appended these non-residents to the starting population, creating corresponding synthetic records according to the number of non-resident pension beneficiaries by age, sex and pension type. We also imputed pensions based on group averages. In the simulation, the population of pensioners living abroad is excluded from all modelled processes except mortality.

We model only Slovenian pensions while, during the simulation process, some persons (also) gain their pension rights abroad (migrants and cross-border workers). To avoid misleading conclusions based on too low pensions, we have excluded pensioners with foreign pensions from the analysis. Namely, as foreign pensions are not simulated, the simulation of only their Slovenian pensions for the proportion of time worked in Slovenia would underestimate their total retirement incomes. The persons who worked in Slovenia throughout their careers would be (rightfully) attributed much higher pensions.

3. Pension system and socio-economic context

The Slovenian pension and disability insurance system is a pay-as-you-go one. It is uniform and mandatory for all employed persons and, in some cases, also for persons generating some income from other gainful activity (contractual work and student work through student brokerage services). Inactive

[7] Partly retrieved from the Eurostat website (https://ec.europa.eu/eurostat/data/database), and partly obtained from the Eurostat.

persons can join the system voluntarily. All these persons are included in the insurance scheme under the same Act – Pension and Disability Insurance Act (ZPIZ-2, 2012) – and covered by the same insurance provider – the Pension and Disability Insurance Institute of Slovenia. The system is financed through social security contributions and direct transfers from the central government budget. The total contribution rate for pension and disability insurance is 24.35% of gross earnings without a ceiling (the employee´s contribution is 15.50%, and the employer´s is 8.85%). Transfers from the central government budget accounted for 20% of the total 2018 revenues of the Pension and Disability Insurance Institute of Slovenia. (European Commission, 2018, p. 228)

The compulsory insurance scheme includes: a) the right to a pension (old-age, disability, survivors', widow's/widower's, and partial pension); b) disability insurance entitlements (occupational rehabilitation, reassignment and reduced working hours, reimbursement of travel expenses, and benefits from the disability insurance); c) supplemental entitlements (assistance and attendance allowance, and survivor's supplement to own pension); and d) other entitlements (annual supplement). The current DYPENSI version simulates the old-age-, disability- and survivors' pensions (including widow's/widower's), as well as a survivors' supplement to own pension.

All pensions are individual (i.e. they are not assessed at the household/family level). The only exception is survivors' pensions if there are more eligible dependent children and/or a spouse. If there is only a widow/widower, she/he may be entitled to a survivor's (widow's or widower's) pension, depending on her/his age. If a widow/widower receives own old-age or disability pension, she/he can choose the more favourable option: either a survivor's pension or own pension plus a survivor's supplement to own pension. It should be noted that, under the Slovenian pension system, the disability pensions are not converted into old-age pensions at the statutory retirement age (SRA), but the beneficiaries receive disability pensions until they die. Therefore, we consider a disability pension as a retirement benefit in this report.

The SRA is 65 years for both sexes, while the minimum age for early retirement is 60 years. The pension qualifying period is equal for men and women: 15 years if aged 65 years or more, or 40 years (without a purchased period) if aged 60-64 years.

The Slovenian pension system has changed relatively frequently in recent decades. All changes were towards the tightening of the retirement conditions and, since the implementation of the Pension and Disability Insurance Act (ZPIZ-1, 1999) in 2000, also towards equalising the retirement conditions for men and women. While, under the terms of the Pension and Disability Insurance Act (ZPIZ, 1992; in force from 1992 to 1999), women could retire five years earlier than men, after the implementation of the ZPIZ-1 (from 2000 to 2012) they could retire only two years earlier. Due to the retirement conditions, women retired with shorter pension contribution periods but were entitled to higher accrual rates for each year of the contribution period. The Pension and Disability Insurance Act (ZPIZ-2, 2012) equalised the retirement conditions for men and women, but the changes were introduced gradually, starting in 2013, so that the retirement conditions were equalised only in 2019. The required higher retirement age and longer pension contribution periods for women resulted in higher pensions for women. This was due to the fact that, upon retirement, they were entitled to higher accrual rates than they would have been if they could have retired younger or with a shorter pension contribution period. Despite the

equalisation of retirement conditions and the consequent ever longer pension contribution period of women upon retirement, the higher accrual rates for women than for men for the same length of a completed pension contribution period still applied until 2019. Thus, in 2019, a pension for a man with a 40-year pension contribution period amounted to 57.25% of his pension assessment base, while for a woman with an equally long pension contribution period it amounted to 63.5% of her pension assessment base. Due to the relatively large difference in accrual rates, the old-age pensions of newly retired women have been higher in recent years than the old-age pensions of newly retired men.

The Act Amending the Pension and Disability Insurance Act (ZPIZ-2G, 2019) implemented a significant change in the pension legislation in 2020: a gradual increase and equalisation of the accrual rates for men and women to 63.5% (the pension assessment rate is 29.5% for 15 years of insurance and 1.36% for each subsequent year). Equalisation of accrual rates is a continuation of the gender equalisation process in pension insurance. Namely, after equalising retirement age for men and women, it was no longer possible to justify the gender differences in accrual rates by differences in retirement age. Consequently, starting in 2025, pay-related and other gender gaps in the labour market will be fully transferred into pensions. From that year on, following a gradual increase in the accrual rates for men, the men's pensions will be assessed at 63.5% of the pension assessment base (for a 40-year pension contribution period). Due to the 2020 amendments to the Pension and Disability Insurance Act (ZPIZ-2H), both men and women will be entitled to higher pensions, but due to the equalisation of accrual rates, a larger gender pension gap can be expected.

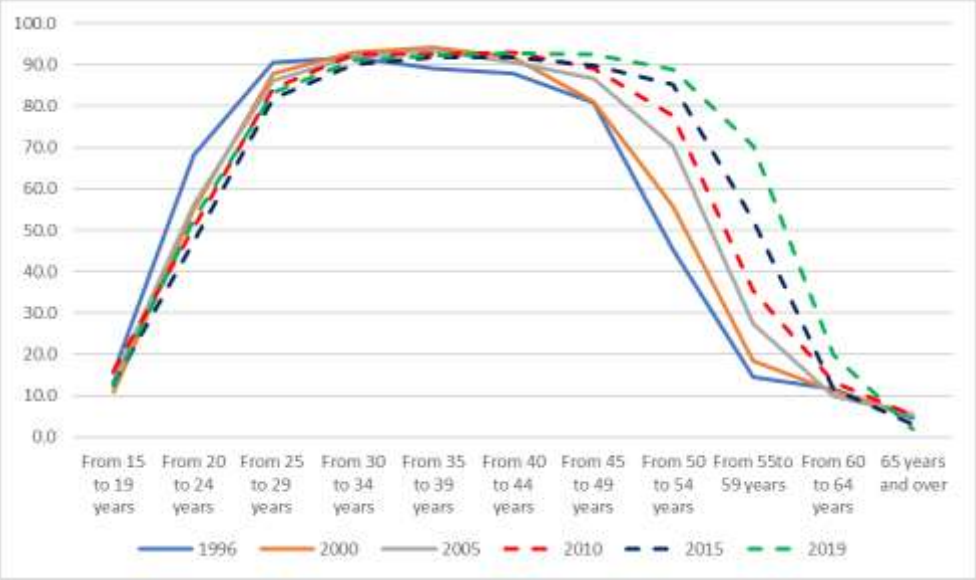
The described legislation changes have had a considerable effect on activity rates. Graph 1 shows the evolution of women's activity rates by age group from 1996 to 2019 by data at six points of time (years). Activity rates of women aged from 25 to 49 years were very high in all observed years and amounted to between 80.1% and 93.1%. Starting in 2000, women's activity rates in the age groups 30-34, 35-39 and 40-44 even exceed 90%. The graph also shows that women tend to stay in the labour market until an ever higher age. In the second half of the 1990s,[8] most women left the labour market before the age of 55, while in 2019, women's activity rate in the age group 55-59 exceeded 70%. More precisely, until the first half of the 2000s, women's activity rates started to decline already at their age of 50 but, in recent years, they start to decile only after the age of 59. Women who retired in the second half of the 1990s and at the beginning of the new millennium thus had relatively short careers. An increasing statutory retirement age, the tightening of early retirement options and changes towards gender-neutral retirement conditions are the main reasons for the increasing activity of women at higher ages.

In the late 1990s, the women's activity rates in three youngest age groups (up to age 30) started to decrease. This was due to women's prolonged education, but some research also points to the influence of labour market conditions that were less favourable for young women than young men. Bartolj *et al.* (2020)[9] found out that women aged 25-36 in 2017 entered the labour market (on average) 0.7 years later than men of the same age, whereas the exact opposite was the case with women aged 45 or over in 2017. These differences can partly be attributed to the financial crisis (in 2010, when the recession was already in full swing, these generations were 18-29 years old), as younger women had more difficulties entering the labour market than young men. The research also showed that the unemployment rate was higher

[8] This is evident from the annual data not presented in Graph 1.
[9] A sample of PDIIS working-history data was used for the analysis.

for women than men, and the unemployment rate for young people (aged 20-29) was higher than the overall one, in the entire observed period (1996-2019). The position of young people deteriorated particularly between 2008 and 2014, with young women being in a worse position than young men. In 2014, the unemployment rate was 9% for all men and 10.6% for all women, and 16.2% for men aged 20-29 and as much as 22.6% for young women. The differences between men and women regarding the entry into the labour market, the termination of insurance, and periods of unemployment affect the difference in the completed pension contribution period. The same research showed the difference to be greatest for young age groups. Men aged 29 in 2017 completed, on average, 1.2 years of pension contribution period more than women of the same age. Similarly, the men aged 39 completed, on average, 0.98 years of pension contribution period more than women of the same age. However, in older age groups, women completed more years of the pension contribution period than men of the same age. Women aged 49 completed, on average, 0.9 years more than men of the same age, and women aged 59 (on average) 1.8 years more.

Graph 1: Activity rate of women, by age group; selected years, 1996-2019



Source: Eurostat database, *https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_argan&lang=en*

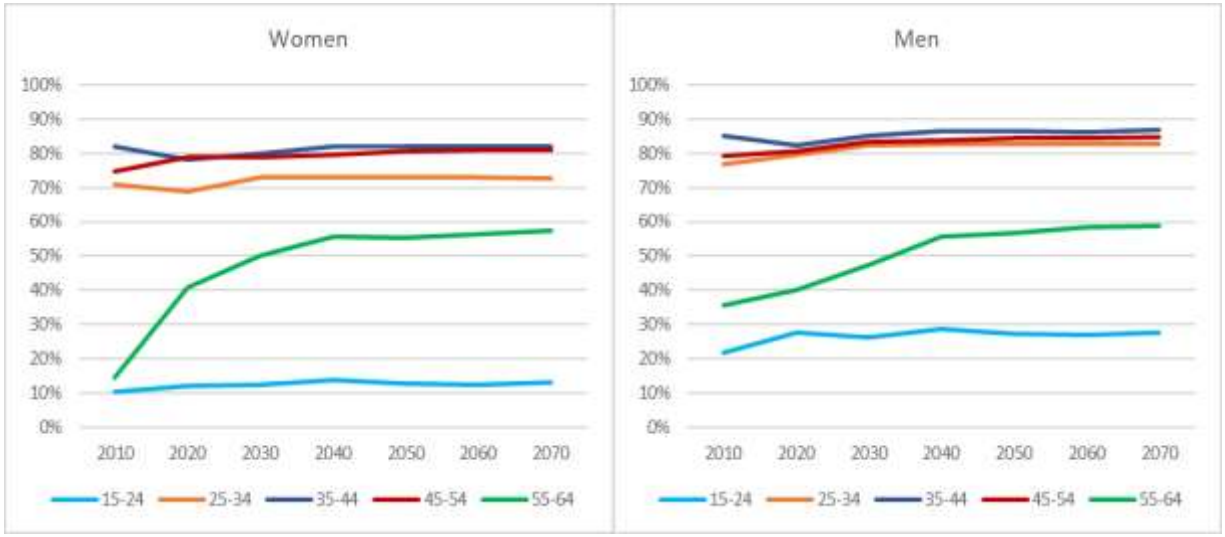
Simulated employment rates by gender and age group are presented in Graph 2. The DYPENSI model simultaneously aligns simulated employment rates to target values set in the parameter tables. The target employment rates refer to "register" employment rates, where persons in employment are considered persons in paid employment and self-employed persons covered by compulsory social security insurance.[10] The target employment rates follow the trends projected by the Ageing Working Group of the EU Council's Economic Policy Committee. In the age groups over 60 years, the alignment to the target activity rates is combined with retirement decisions.

The employment rate of women aged 55-64 is expected to increase substantially, to 55.6% in 2040. After 2040, very similar activity rates are also expected for men in this age group. After 2040, there will be only minor changes. In all age groups, activity rates are higher for men than for women; the differences

[10] Excluded are trainees and persons who perform work on civil contracts, cash-in-hand work, or temporary and occasional work through student brokerage services.

are the biggest in youngest age groups (15-24 and 25-34). Women in paid employment in Slovenia usually opt for part-time employment only after the parental leave and until the child's age of three, which is the period of their entitlement to pension credits for the difference up to the full-time employment. This means that part-time employment does not represent an important factor for GPG.

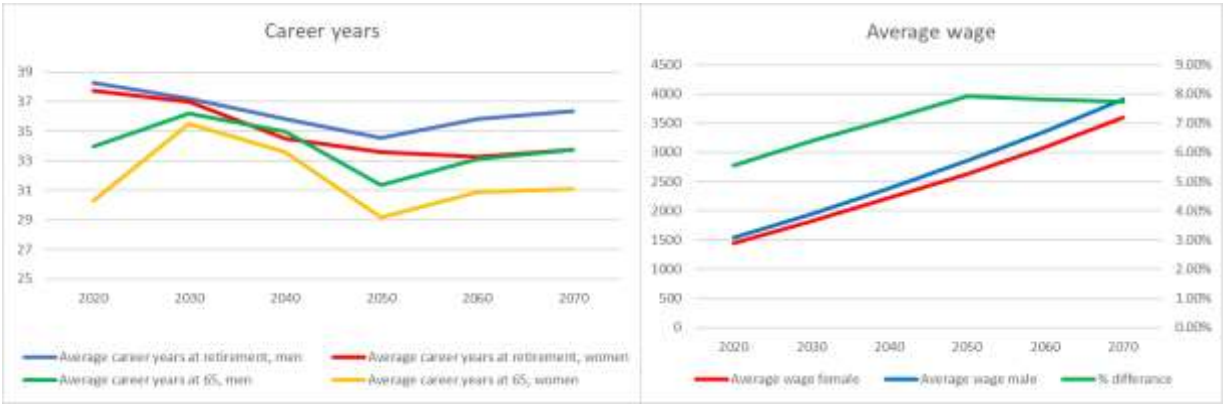
Graph 2: Employment rate in recent and future years, by gender and age group; selected years, 2010-2070



Note: Persons in employment are persons in paid employment and self-employed persons who are covered by compulsory social security insurance. Trainees and persons who perform work on civil contracts, cash-in-hand work, or temporary and occasional work through student brokerage services, are not considered as persons in employment.
Source: DYPENSI projections.

Graph 3 shows the number of career years at retirement and average salaries at six points of time. The number of career years is calculated in two variants: 1) at the statutory retirement age of 65, and 2) in the year and at the age when people actually retire, i.e. start receiving a disability-, old-age- or survivors' pension (which can be before the SRA).Women and men currently retire with very similar career lengths despite the higher share of women who retire with a survivors' pension. The number of career years at retirement is dropping until 2050, driven by entry into the labour market at higher ages and less stable careers than before 2000. The gender differences in the employment rates and unemployment spells result in a lower number of career years at retirement for women than men. The simulated gap is one year in 2050 and increases to 2.6 years in 2070, mainly due to lower women's employment rates at a younger age. The number of career years at age 65 (the SRA) decreases until 2050 and is lower than the number of career years at retirement for both genders. This is mainly due to the individuals with no, or less than 15, career years, who consequently have no pension rights. After 2050, a career gender gap amounts to 2-3 years.

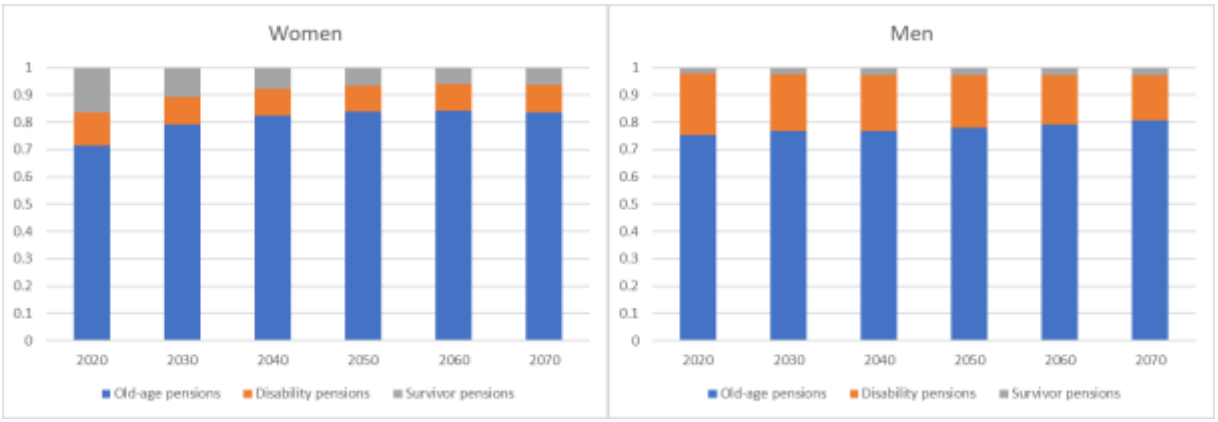
Graph 3: Number of career years at the statutory retirement age or when retiring and average salaries during the career, by gender; selected years, 2020-2070



Note: Average salaries are at constant 2007 prices.
Source: DYPENSI projections.

The simulation results presented in Graph 4 show that men are much more likely to receive a disability pension than women, but women more often receive a full survivors' pension from a spouse. A very important (and expected) development is the relative decrease in the percentage of women with a full survivors' pension from a spouse. As the result of an increasing number of widowed women with their own retirement pensions exceeding their potential survivors' pensions, only 6.2% of women pensioners will receive a full survivors' pension in 2070 (compared with 16.5% in 2020).

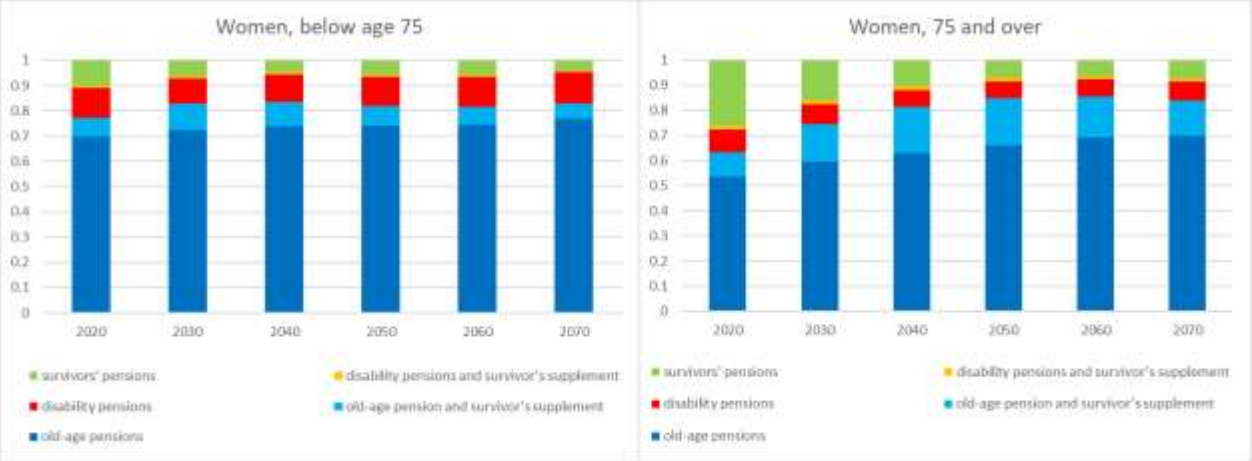
Graph 4: Percentage of women and men by the main pension type; selected years, 2020-2070



Note: Possible survivors' supplements are added to the main pension type.
Source: DYPENSI projections.

Graph 5 shows the share of women by pension type in more detail. According to simulations, in 2020, only 9.9% of women younger than 75 received full survivors' pensions from a spouse, while the respective proportion was 26.2% for women aged 75 years and over. The shares will to decrease for both age groups: to 4.1% for women below 75 years of age, and 7.3% for women aged 75 and over. On the contrary, the share of women receiving a survivors' supplement to their own old-age pensions increases in the older age group (from 9.7% in 2020 to 14% in 2070), which confirms that more and more women will receive their own old-age pensions.

Graph 5: Percentage of women with only a survivors' pension, only an old-age pension, only a disability pension, or a mixed pension; by age group, for selected years, 2020-2070



Source: DYPENSI projections.

4. Base results

4.1. Overview

Table 1 gives an overview of the projection results, where the GPGs are evaluated at the means of various pension concepts, including or excluding zero pensions, and for five populations. The top row in panel A represents the Eurostat's definition of the GPG. The GPG declines until around 2050 when it amounts to only 0.7%. It then increases and reaches the level of 5.7% in 2070. The results published by the Eurostat[11] show that the GPG was at 16.4% in 2019, which is very close to the GPG simulated using DYPENSI (Table 1). However, when interpreting the DYPENSI results, we should keep in mind that simulated results are produced using a model that has a larger administrative sample as the starting base (117,174 individuals) than the EU-SILC (its 2018 sample consists of 25,843 individuals). Besides, the EU-SILC pension variables include the pension and all other benefits/salary compensations disbursed by the Pension and Disability Insurance Institute of Slovenia, which are not pensions (attendance allowance, disability allowance, an annual bonus for pensioners, and salary compensations for disabled workers). DYPENSI, on the other hand, simulates only pension amounts.

[11] Available from: https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_pnp13.

Table 1: Projected GPG at the mean, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.063	0.020	0.007	0.027	0.057
65-74 with pension	0.106	-0.020	-0.010	-0.009	0.063	0.073
75+ with pension	0.224	0.137	0.030	0.008	0.000	0.041
At retirement	-0.023	0.046	-0.011	0.042	0.042	0.030
All pensioners	0.132	0.059	0.020	0.012	0.030	0.061
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.082	0.027	0.010	0.036	0.066
65-74	0.142	-0.011	-0.013	0.001	0.083	0.086
75+	0.259	0.161	0.043	0.010	0.003	0.045
At SRA	0.077	-0.009	-0.070	0.064	0.105	0.068
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.046	0.007	-0.002	0.017	0.048
65-74 with pension	0.094	-0.035	-0.017	-0.018	0.049	0.068
75+ with pension	0.218	0.126	0.015	-0.002	-0.008	0.030
At retirement	-0.059	0.047	-0.024	0.024	0.040	0.023
All pensioners	0.112	0.042	0.006	0.001	0.020	0.051
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.052	0.013	0.004	0.023	0.055
65-74 with pension	0.102	-0.029	-0.011	-0.014	0.059	0.074
75+ with pension	0.186	0.084	-0.025	-0.032	-0.034	0.007
At retirement	-0.049	0.067	-0.017	0.036	0.023	0.026
All pensioners	0.127	0.049	0.014	0.009	0.028	0.060

Source: DYPENSI projections.

The simulation shows that the GPG declines until 2050 and increases later. This is due to three reasons: a) a very low − and even negative − GPG at retirement in the first part of the simulation horizon, b) gender-neutral pension legislation from 2025 onwards, and c) lower activity/employment rates of younger birth cohorts of young women compared to young men, which is not the case with women currently retiring and those born until the late1970s.

At retirement, the GPG is negative in 2020, which is not very surprising.[12] Before the latest major pension reform in 2012, women were allowed to retire with shorter working careers than men. Consequently, on average, they received lower pensions (a pension is calculated as the product of the pension base, which depends on salaries, and the accrual rate, which depends only on the career length). To compensate for shorter careers, women were eligible for higher accrual rates than men for the same career length. In 2012, the retirement conditions for men and women eventually became equal (there was a transition period until 2019), but women were still eligible for higher accrual rates. Considering the facts that women in Slovenia mostly work full-time, that gender pay gap is much lower than in the EU on average, and that currently men and women retire with similar numbers of working years, one would expect higher pensions at retirement for women than men. Since 2020, the accrual rates are gender neutral (there is a transitional period until 2025) and, for pensioners entering the pension system

[12] In 2018, the pensions of new women old-age pensioners were 3.4% higher than the pensions of new man old-age pensioners. In 2019, the difference was 4.2% (Bartolj, Kalar and Kump, 2020, pp. 27-28).

after 2025, (almost)[13] all life-time gender differences in the labour market will be kept in retirement. Therefore, the simulated GPG at retirement increases and becomes positive after 2025, when new pensioners enter retirement under the gender-neutral pension legislation.

The activity and employment rates of younger women (below age 30) are lower than those of younger men, as evident from Graph 1 and Graph 2. The study by Bartolj *et al.* (2020) reveals that, at their young age, currently active women aged 45 and over had equal or higher employment rates than men. Consequently, they (and women from older birth cohorts in general) collected longer pension contribution periods than men of the same age. Graph 1 also shows that the activity rates of women in younger age groups decreased substantially between 1996 and 2000. Therefore, we can expect that women currently up to 45 years old will complete shorter pension contribution periods until retirement than older women. This will lead to lower pensions and higher GPGs towards the second half of the simulation horizon.

The second and third row in panel A show a significant difference in the GPG between younger (65-74) and older (75+) pensioners. The GPG increases substantially with higher age. The same conclusion can be drawn from the Eurostat's data on GPG until 2019 and is driven by three major causes. First, activity rates of women in the older age group were lower and therefore more women pensioners are eligible for survivors' pensions only, or they opted for the one after their spouses died. Second, women pensioners from the older age group were able to retire with shorter careers (a shorter pension contribution period) under the then applicable pension legislation, and therefore received lower accrual rates that led to lower pensions compared to men's. Third, women's educational attainment in the older age group was lower than the men's, which led to their lower salaries and lower pensions.

In both selected age groups, a similar pattern can be observed over time: the GPG first declines (only until 2060 for pensioners aged 75 and over, and only until 2030 for pensioners aged 65-74) and then increases. The GPG for the older age group remains higher until 2060, when a reversal occurs. From 2060 on, the GPG is higher among younger pensioners (aged 65-74) than among those aged 75 years and over, as the simulated GPG at retirement increases and therefore impacts younger pensioners.[14]

As mentioned above, when zero pensions are included (panel B), the GPG can be interpreted as a combination of the standard GPG and the pension coverage gap between women and men. The EUROMOD model[15] was used to estimate the pension coverage gap, which was at 1.1% in 2017 and 0.8% in 2018. This means that slightly more men than women received a pension. Therefore, panel B values are almost always higher than the corresponding ones in panel A (without zero pensions), but the differences are quite small, especially in later years. This suggests lower pension coverage for women than for men, which can be confirmed with very similar, but still lower, activity rates for women.

[13] On average, women will still retire with slightly higher accrual rates for the same career length than men. The reason is an additional accrual rate for taking care of the child in his/her first year (mostly women take the prenatal leave, and the parent who took parental leave is eligible for an additional 1.36% accrual rate per child).

[14] Older pensioners (aged 75+) include women whose pensions at retirement exceed those of men.

[15] The EUROMOD model for Slovenia uses the EU-SILC data; however, greater accuracy is achieved by using the national version of EU-SILC that enables the isolation of pension amounts. The EU-SILC variables with pension amounts also include other benefits disbursed by the Pension and Disability Insurance Institute of Slovenia.

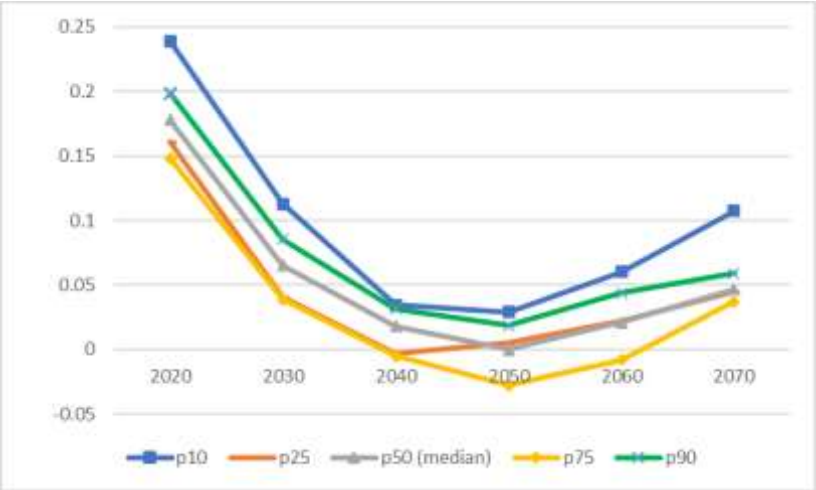
Excluding survivors' pensions from the calculations (panel C) results in slightly lower GPGs for all pensioners aged 65+ and for all selected population groups. Full survivors' pensions from a spouse are usually lower than the women's own old-age pensions, so excluding them from the calculation increases the average pension of women (who are more frequently receiving survivors' pensions). On the other hand, widows/widowers are entitled to a survivors' supplement in addition to their own pensions; however, the supplement amounts are relatively small and thus do not significantly influence the average pension amounts.

Panel D shows the GPGs resulting from old-age pensions only,[16] which means that only pensioners who fulfilled required retirement conditions are taken into account. The GPGs among all pensioners are higher than in panel C. The reason is disability pensions, which are lower than old-age pensions and more frequently received by men. Excluding them increases the average pension of men more than that of women. The only exception is the GPG for pensioners aged 75 and over. This is due to a significantly lower number of disability pensioners because of higher mortality among men and the disabled. It is worth noting that the simulated 2020 GPG at retirement (-4.9%) is very close to the one calculated from the official Pension and Disability Insurance Institute of Slovenia's data (PDIIS, 2020) on the average old-age pension at retirement (-4.2%).

The considered GPGs at the pensions' means do not necessarily provide a fully adequate perception of the pension differences between women and men. For instance, theoretically, the men's average pension could be pushed upwards by a few very high values while no difference in the mean pension between women and men would be observed (Dekkers and Van den Bosch, 2021). For this reason, it is helpful to look at the GPG at various points in the distribution of pensions, as is done in Graph 6. A percentile is a value below which a certain percentage of data, in this case pensions, falls. GPGs at median amounts are very close to those at average pensions (slightly below from 2030 on, which is evident from the comparison of Graph 6 and the values in Table 1), and follow the same pattern over time. It is quite striking that the GPGs are the biggest at the tails of income distribution (at the 10^{th} and the 90^{th} percentile), which indicates that women at the lower end and at the top of distribution receive much lower pensions than men. The GPG at the 10^{th} percentile even increases more intensively than the GPG at mean after 2050.

[16] In Slovenia, disability pensions are not transformed into old-age pensions at SRA.

Graph 6: GPG (standard version) at various percentiles of the distribution of pensions (%)



Source: DYPENSI projections

4.2. GPG for the complete statutory pension, base scenario

Graph 7 presents the GPG (l, rbwb), which is the gender pension gap based on gross old-age-, disability- and survivors' pensions. The guaranteed minimum income is not included.[17]

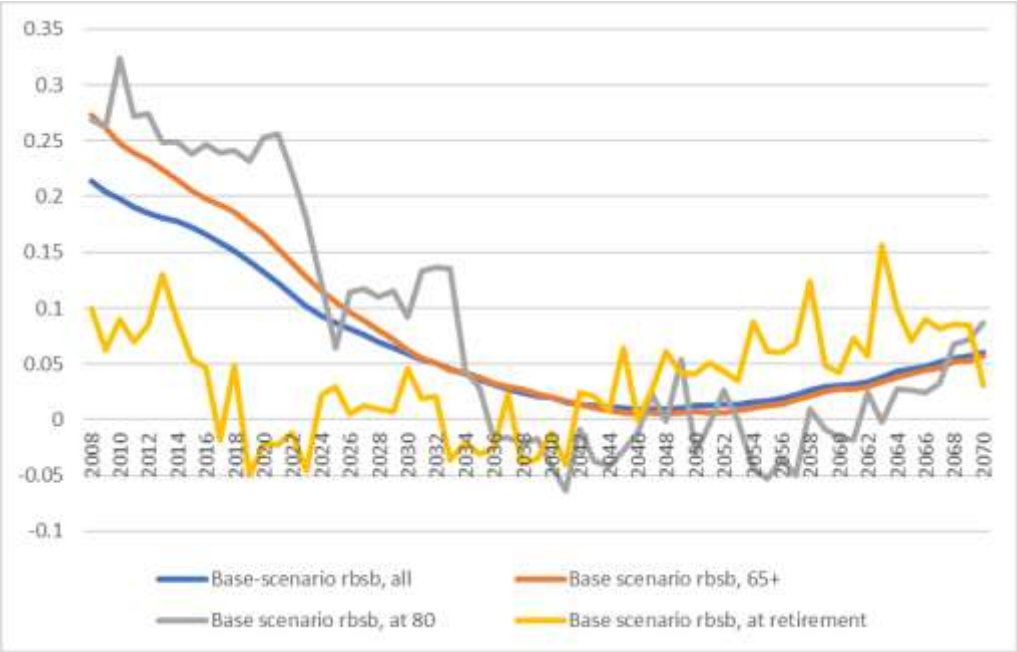
The two irregular lines show GPGs for two small groups: the new retirees who receive old-age-, disability- or survivors' pension for the first time, and pensioners at the age of 80. The two smooth lines show GPGs for two larger groups: all pensioners and all pensioners aged 65 and over (the latter being the Eurostat official definition). The GPG for all pensioners amounts to around 0.27 in the initial simulation year (2008), which is only one percentage point less than the GPG published by the Eurostat (0.28).[18]

The GPGs for all pensioners and for pensioners aged 65 and over show a decline until the late 2040s when they come very close to zero but remain positive. Decreasing and very low GPGs are driven by high women's activity rates during the latest decades and especially the increasing activity rates of women at higher ages (55 and over; see Graph 2); higher educational attainment and consequently higher salaries of women; and a lower number of women receiving survivors' pensions. Since the late 2040s, the GPGs start to slowly increase. One of the reasons is that there are fewer and fewer women left who retired before 2025 with higher accrual rates than those for men with the same career lengths. Furthermore, an additional 1.36% accrual rate for each child, gained mainly by women, increases women's pensions to a much lesser extent than higher accrual rates for women before 2025.

[17] The minimum income is guaranteed through cash social assistance and income support. However, both benefits depend on the family net income and assets, and are currently not modelled in the DYPENSI due to data constraints.

[18] Retrieved from: https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_pnp13.

Graph 7: Base-scenario gender pension gap; gross old-age, disability and survivors' pensions



Source: DYPENSI projections.

The increases in GPGs towards the end of the simulation period are also due to gender differences in the employment rates in the younger age groups, which affect the GPG as women currently aged up to 45 retire. For younger age groups, these differences lead to lower women's pension contribution periods at the time of retirement compared to men's and consequently to lower accrual rates and pensions. On the contrary, the employment rates of women currently aged 45 and over are equal or even higher than the men's in the same age groups. Around 2040, when persons currently aged up to 45 will start retiring, the gender difference in career lengths increases, which is evident from Graph 8.

Graph 8: Average career length at retirement; all pensioners in the base scenario

Source: DYPENSI projections.

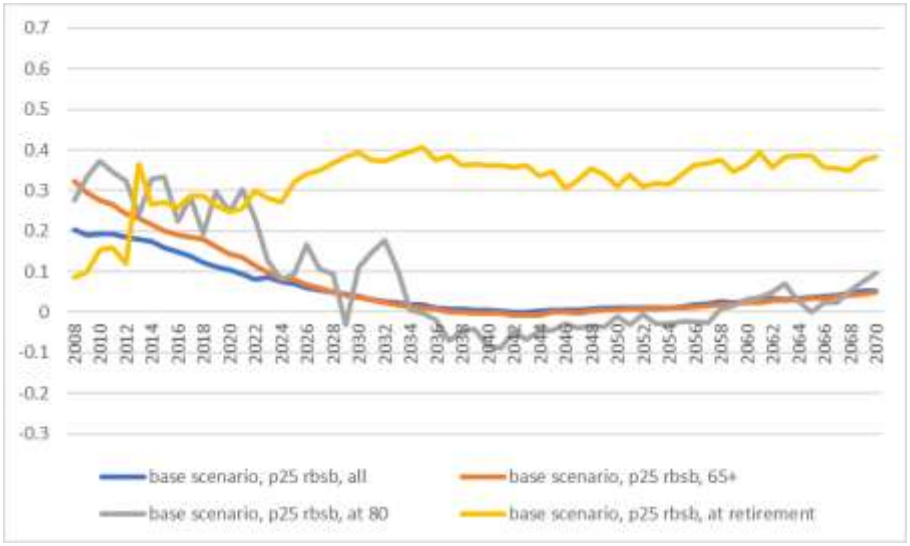
The GPGs at retirement around 2020 are negative, which means that women, on average, retire with higher pensions than men. Until 2025, women still profit from accrual rates that are higher than the men's, which leads to higher women's pensions for the same career length. As women and men currently retire with very similar career lengths, higher accrual rates for women more than compensate for their lower pension assessment base (a consequence of lower women's salaries). Besides, the gender pay gap in Slovenia is among the lowest in the EU. Since 2025, the gender-neutral pension rules result in (mostly) positive GPGs at retirement.

Graph 9 presents the GPGs based on the 25th percentile rather than on the ratio of average gross pensions of women and men (Graph 7). GPGs at the 25th percentile are lower than those based on means and, in the late 2040s, come very close to zero. At the end of the simulation period, they increase (like the GPGs based on means in Graph 7) and converge with the GPGs at the mean. This indicates that, at the lower part of the income distribution, the pensions of men and women are closer to each other than at the mean.

On the other hand, GPGs at retirement are considerably higher at the 25th percentile than those based on means, and they do not decline in time. It seems that, at this (lower) part of the income distribution of the new retirees, women are likely to enter into retirement with much lower pensions than men. This leads to the conclusion that women more frequently than men receive survivors' pensions (which are, on average, lower than the old-age or disability pensions).

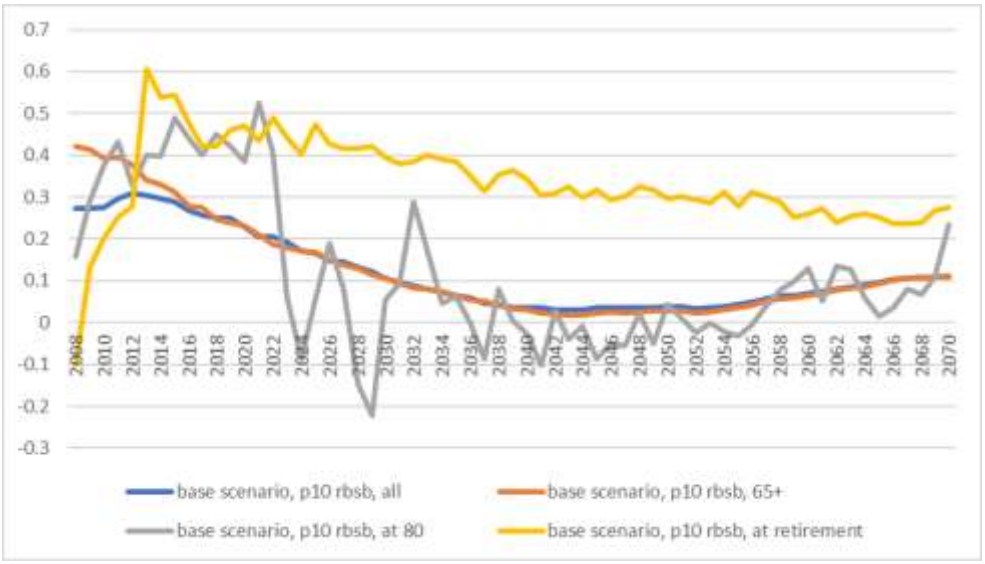
One would expect the GPG at the lower part of the income distribution to be wider than at the mean, but the GPGs at the 25th percentile do not confirm this. Therefore, we also present GPGs at the bottom of the income distribution, that is, at the 10th percentile (Graph 10). These GPGs are very different from those at the 25th percentile, as the GPGs at the 10th percentile are higher than the GPGs based on means. The difference between GPGs at the 10th and the 25th percentile is highest at the start of the simulation period; it decreases thereafter but persists in the entire simulation period. This means that more women than men receive very low pensions at the lower end of the income distribution. There are more reasons for this: 1) women have somewhat shorter careers than men; 2) there are more women with pensions based on the minimum pension base; and 3) there are more women than men with survivors' pensions, which are lower than the old-age pensions.

Graph 9: Base-scenario gender pension gap (25th percentile); gross old-age, disability and survivors' pensions



Source: DYPENSI projections.

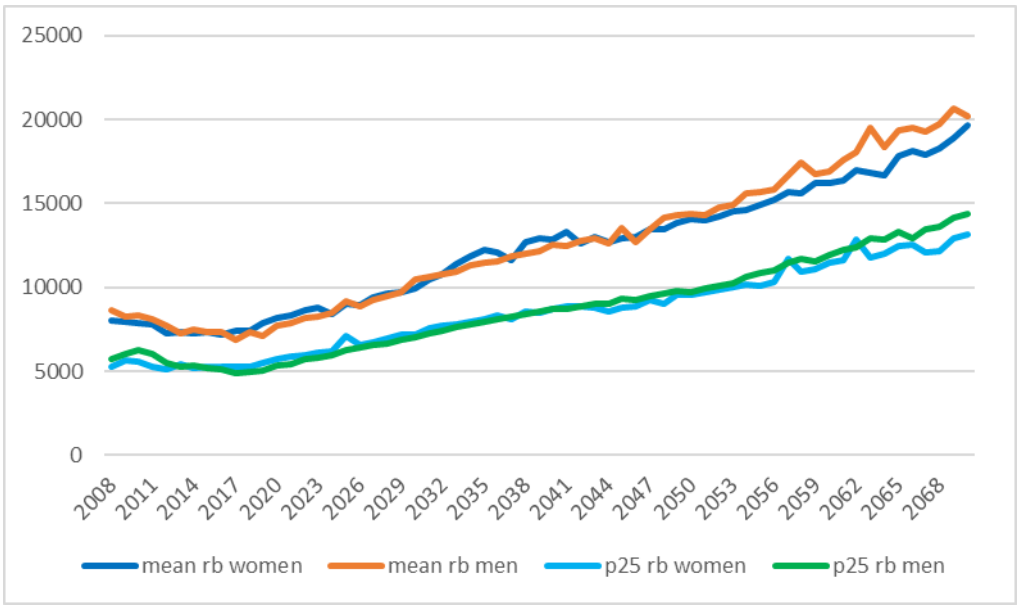
Graph 10: Base-scenario gender pension gap (10th percentile); gross old-age, disability and survivors' pensions



Source: DYPENSI projections.

Graph 11 shows the mean and the 25th percentile old-age-plus-disability pensions of men and women at retirement. The survivors' pensions are left out (but are included in Graph 12).

Graph 11: Average and 25th percentile old-age and disability pensions at retirement, by gender (€; constant prices)

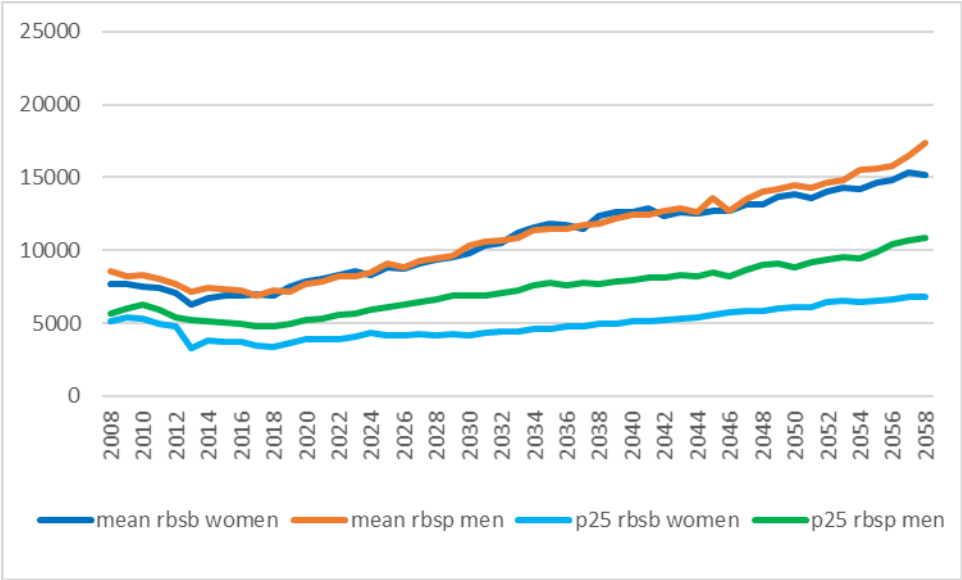


Source: DYPENSI projections.

As could be expected on the basis of GPGs' values, the mean and the 25th percentile old-age-plus-disability pensions for men and for women are very close to each other. Until 2025, the average women's pensions at retirement are higher than the men's; only after 2050, men receive somewhat higher pensions than women. Pensions at retirement at the 25th percentile show a similar pattern, but the differences between men's and women's old-age pensions are even smaller. Such very similar old-age pension amounts for men and women are caused by the Slovenian labour market characteristics: women's high participation rates and a low gender pay gap.

Pension amounts at retirement are lower if the survivors' pensions are included (Graph 12). Another consequence of including survivors' pensions are substantial differences between the men's and the women's pensions at the 25th percentile. This confirms our former statement that survivors' pensions are the main reason for high GPGs at retirement at the 25th percentile.

Graph 12: Average and 25th percentile old-age, disability and survivors' pensions at retirement, by gender (€; constant prices)



Source: DYPENSI projections.

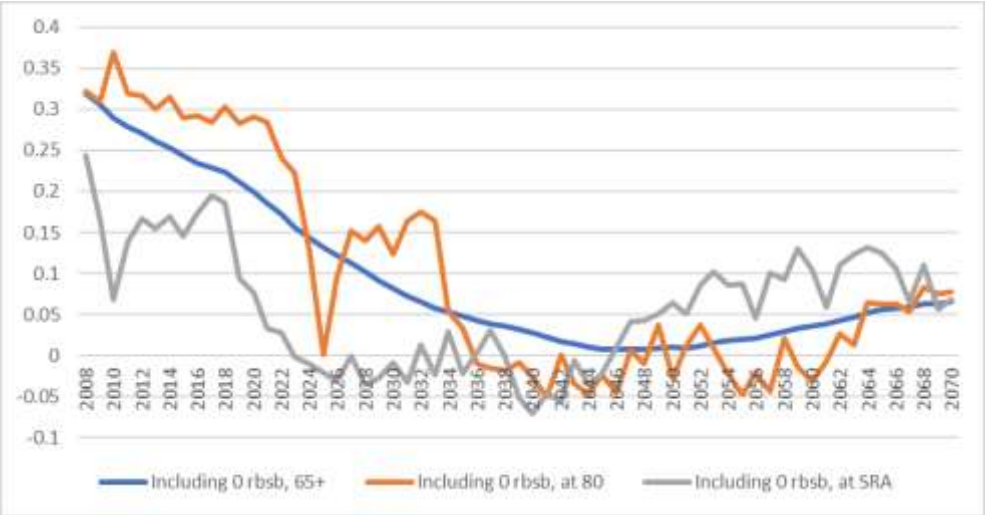
5. Impacts of pension components within the base scenario

5.1. Impact of zero pensions

The standard GPG does not include zero pensions. This is an obvious condition because one might argue that people without pensions are not pensioners. The European Commission recognises this issue by complementing the standard GPG with the "gender gap in pension coverage", which measures the extent to which women have less access to the pension system than men (European Commission, 2018, p. 76). Arguably, it makes sense to combine the GPG and the gender gap in pension coverage into a single indicator, as is done in Dekkers *et al*. (2019, Graph 5, p. 6).

There are only individual pensions in the Slovenian pension system, so persons without own pensions cannot share any household- or family pension. As noted in Section 4.1, pension coverage is slightly lower for women than for men. Graph 13 shows the differences in GPGs based on pensions with and without zero pensions for the population of 65 and older. The results in Graph 13 must be compared with those in Graph 7 to see the impact of taking zero values into account. When including the zero values (Graph 13), the GPG is around 20% higher than without them in the standard GPG around 2020. Over time, as the proportion of older people without a pension decreases, the GPGs in Graph 13 and those in Graph 7 converge around the late 2040s and end up around one percentage point higher at the simulation horizon. Therefore, the conclusion is that the including of zero values causes the GPG to reach higher levels at the start of the simulation, but to decrease faster over time and come very close to the standard GPG.

Graph 13: Gender pension gap including zero-value pensions; mean retirement and survivors' pensions



Source: DYPENSI projections.

5.2. Impact of survivors' pensions

Individuals whose spouses have deceased are eligible for a survivors' pension. The beneficiary needs to be single and reach the minimum age at the time of spouse's death (currently 57.5 years, but will increase to 58 years in 2022). If the person has not reached the minimum age at the time of spouse's death but lacks five years or less, he/she is still eligible for a survivors' pension, though after the expiry of the waiting period, which lasts until reaching the minimum age.

The survivors' pension is equal to 70% of:

- the deceased spouse's pension, if he/she was retired,
- the fictitious disability pension, to which a deceased person would be eligible at the time of the spouse's death if he/she were not retired.

If the surviving partner already receives own old-age or disability pension, he/she can receive a survivors' supplement (15% of the calculated survivors' pension) together with his/her own pension. The survivors' supplement to own pension must not exceed 11.7% of the minimum pension base. A ceiling is applied to the total amount of own pension and a survivors' supplement to own pension, which is the amount of a pension for a man based on the maximum pension base and 40 contribution years.

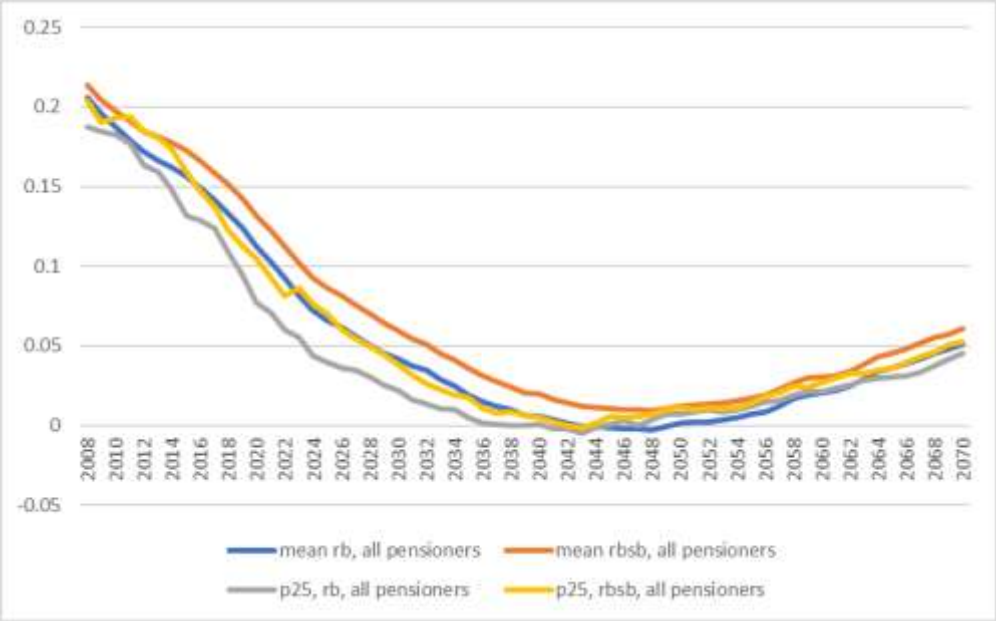
Finally, if the full survivors' pension from spouse exceeds the total amount of own old-age or disability pension and the survivors' supplement to own pension, the surviving person can swap his/her own pension for a full survivors' pension.

The impact of a survivors' pension can be expected to be stronger for women than for men; even more so, since women's life expectancy exceeds that for men. Hence, we expect the standard GPG that includes survivors' pensions to be higher than the GPG variant excluding survivors' pensions. This is also evident from Graph 14. Full survivors' pensions are, on average, lower than the old-age and disability pensions. Including them in the GPG calculation decreases the average pension of women,

who are much more frequently receiving full survivors' pensions (Graph 4). The amount of the survivors' supplement to own pension − also more frequently received by women − is relatively low. Its inclusion in the calculation of GPG does not significantly increase the average (women's) pension amount. Furthermore, as the survivors' pensions are lower than the other pension types, we expect the impact of the survivors' pensions on the GPG at the 25th percentile to be more significant than on the GPG at the means.

As the result of relatively high women's employment rates, which are close to the men's, and higher own pensions of women in the future[19], one can expect the number of women receiving the full survivors' pensions from their spouses to gradually drop. There will be fewer women without their own pensions and fewer women swapping their own pensions for the full survivors' pensions from their spouses (these will be women with very low own pensions), which is also evident from Graph 3 and Graph 4. The impact of the survivors' pensions on the GPG is expected to decrease over time. The GPGs with and without survivors' pensions are therefore expected to converge.

Graph 14: Gender pension gap of all pensioners including survivors' pensions and excluding zero-value pensions



Source: DYPENSI projections.

The results presented in Graph 14 confirm these expectations. As noted before, the GPGs based only on old-age and disability pensions are lower than the standard GPGs based on all pensions. This holds for the GPGs at the mean, but even more so for the GPGs at the 25th percentile. In the (late) 2040s, GPGs for all pensioners and those for old-age and disability pensioners only − especially GPGs at the 25th percentile − converge and then remain more-or-less similar, implying that the effect of survivors' pensions on the GPG decreases over time, as fewer women receive full survivors' pensions.

[19] Compared with current pensioners.

6. Variant scenarios

In this section, we depart from the base scenario and block or adapt some parts of the model to explain the factors that drive the simulated gender pension gaps. The GPG is, at any moment, a function of past labour market behaviour of men and women. So, in the DYPENSI microsimulation model, the simulated GPG is a function of 1) the gender gap in current pension amounts; 2) the gender gap in the previous labour market behaviour of currently active people, and 3) the gender gap in the prospective labour market behaviour of currently active people and future entrants into the labour market. In combination, these determine the GPG, but their effects are evident in different time frames. The pension amounts in the starting dataset affect the GPG in the short run and lose their effect when current pensioners' cohorts die. The impact of currently active people's previous labour market behaviour affects the prospective GPG in the middle-long run. On the one hand, the strongest impact of previous labour market behaviour on pensions can be observed for older active cohorts[20] when they retire. On the other hand, the prospective labour market behaviour of currently active people and future entrants will be the last to affect the GPG, as its impact is more important for younger active individuals in the starting dataset. Obviously, those who have not yet entered the labour market in the starting year will, at retirement, have no observed retrospective labour market history but only simulated labour market history.

In the variant scenarios discussed in this section, the effects of the prospective factors are blocked and the resulting GPGs studied. First, we keep activity and unemployment rates, by gender and age group, at their 2021 levels for the total period of simulation (Scenario 1). Second, we gradually equalise the gender aspect of prospective labour market behaviour: a) activity, unemployment, employment and disability rates, by age group, are set at equal levels for women and men (Scenario 2a), and b) salaries are set equal for women and men, by age group, which means the elimination of the gender pay gap (Scenario 2b). Scenario 2b is cumulative, i.e. it builds on the technical changes introduced in the Scenario 2a. The starting year, i.e. the year in which these scenarios will start diverging from the AWG scenario, is set to 2021. In the end, we will simulate GPGs assuming that the 2019 legislation changes towards gender-neutral pension legislation have not occurred (Scenario 3).

It should be noted that the design of the variants, and therefore the simulations, are only carried out for analytical purposes, and do not represent realistic or desirable developments or policy options.

6.1. Scenario 1: Constant activity and unemployment rates from 2021 on

In the DYPENSI, individuals' labour market behaviour is a combination of micro-level behavioural equations, usually survival regressions, and the monthly alignment (Kump *et al*., 2017). The behavioural equations rank individuals according to their waiting times (calculated from hazard rates) till a particular event may happen. The most important are the hazard rate for the first entry into the labour market and the hazard rate for the duration of unemployment. If an unemployed person is chosen to be re-employed (i.e. has the shortest waiting time for re-employment, calculated using the survival

[20] The older they are in the starting dataset, the longer their observed labour market history in the starting dataset and therefore the stronger the impact on the pension amount when they retire.

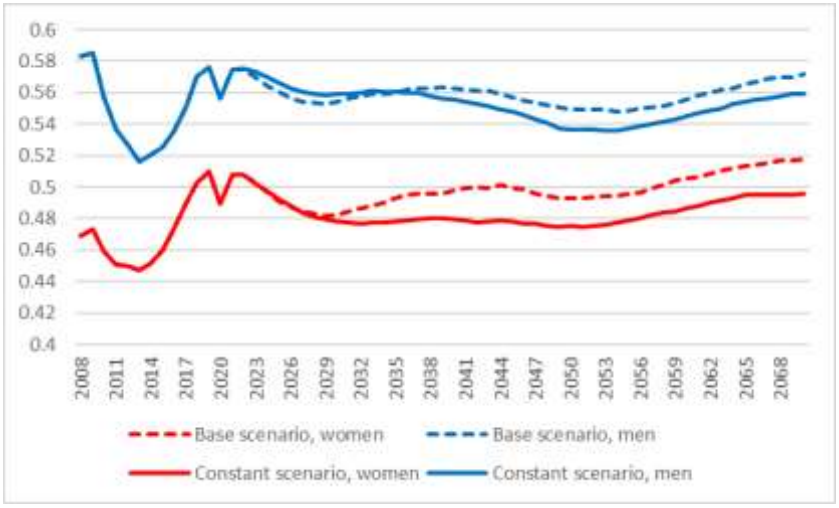
function), he/she "passes on" unemployment to another person of the same age and sex. The relative risk depending on the educational level is taken into account as well.

The behaviour at the individual level is monthly aligned to the target values set in the parameter tables. The target activity, employment and unemployment rates, by one-year age groups and gender, refer to "register" rates, where persons in employment include persons in paid employment and self-employed persons covered by the compulsory social security insurance. Trainees and persons who perform work on civil contracts, cash-in-hand work, or temporary and occasional work through student brokerage services, are excluded from the active population. The target activity, employment and unemployment rates until 2019 are based on actual register-based rates and follow the AWG 2021 projections' trends afterwards. In the age groups over 59 years, the alignment to the target activity rates is combined with retirement decisions, where retirement decisions have a priority over the target activity rates.[21] This means that persons who decide to retire according to the modelled retirement decisions do not extend employment even if their particular age group's employment rate is lower than the target employment rate. However, such situations happen only rarely, as the target employment rates are relatively low.

In the constant scenario, the activity, employment and unemployment rates by gender and age group correspond to those in the base scenario until 2021, while from 2022 onwards, we keep them at their 2021 levels. Consequently, 2022 is the first year in which the constant scenario diverges from the base one. Salaries and salary equations are not adapted; hence, the salary differentials between men and women throughout the simulation do not differ from those in the base scenario. Given a changing age distribution, the constant activity, employment and unemployment rates by age group imply changing overall rates for the whole population at active age, shown in Graph 15. Overall employment rates for the population at active age are lower in the constant scenario than in the base one as AWG projections assume an increase in the employment rates for both men and women from 2021 on. An increase is projected mainly for the age groups 60 years and over.

[21] The current DYPENSI version does not simulate part-time work. With respect to our definition of persons in employment (that excludes trainees and persons who perform work on civil contracts, cash-in-hand work, or temporary and occasional work through student brokerage services), part-time work is mostly performed during the period of care for a young child covered by a pension credit.

Graph 15: Scenario 1 – Employment rates (population aged 15-74), assuming constant activity, unemployment and employment rates from 2021 onwards

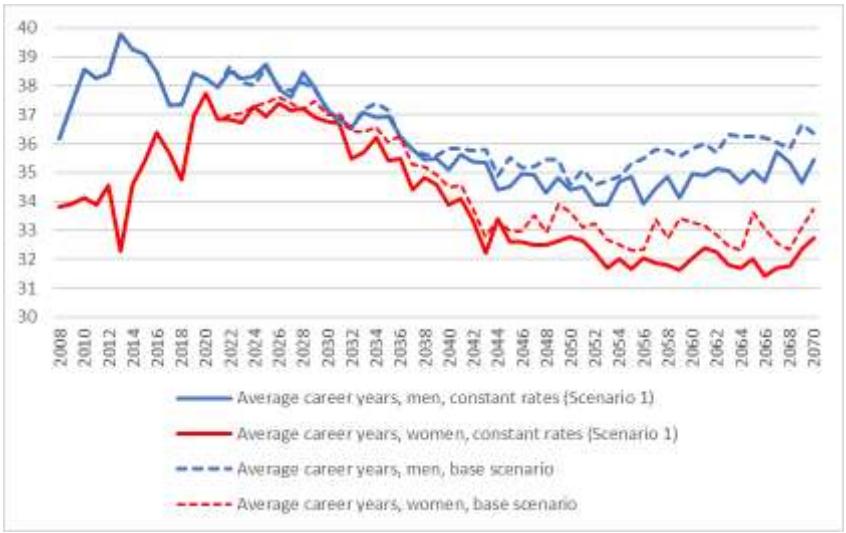


Source: DYPENSI projections.

Note: Employment rates are based on the definition of employed persons that differs from the Labour Force Survey (LFS) definition. Persons in employment include persons in paid employment and self-employed persons covered by compulsory social security insurance. Trainees and persons who perform work on civil contracts, cash-in-hand work, or temporary and occasional work through student brokerage services, are not considered as persons in employment. Employment rates in Graph 14 are thus lower than the ones published by the Eurostat (https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_ergan&lang=en).

Activity and unemployment rates from the constant scenario affect the GPG only after these persons have retired. Consequently, the effect of changing labour market behaviour becomes, to some extent, apparent in the simulation results a few years after the change, and becomes entirely evident only in the long run. Lower employment rates lead to shorter careers at retirement (Graph 16), which implies lower accrual rates.

Graph 16: Average career length at retirement for all pensioners in the base scenario and in the scenario with constant activity, unemployment and employment rates

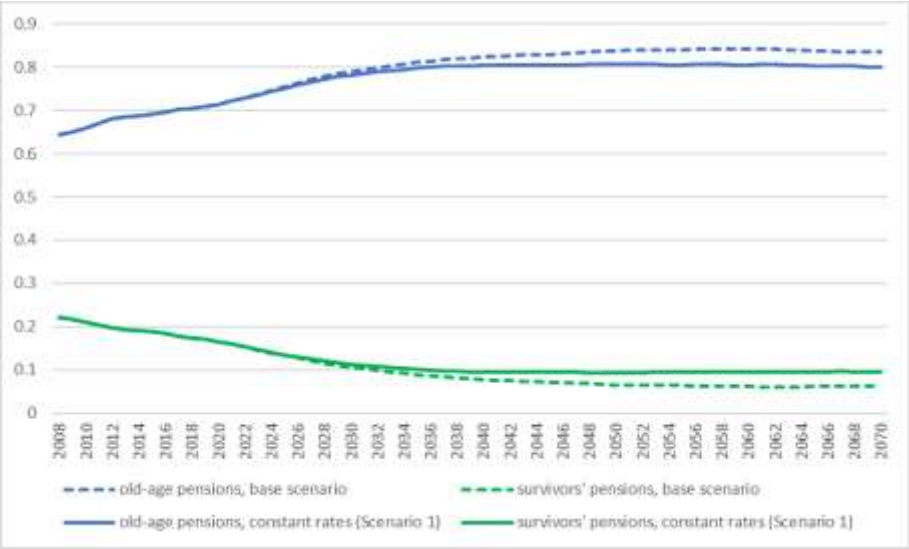


Source: DYPENSI projections.

Although a survivors' pension is a derivative of an old-age- or disability pension of the deceased partner, the change in the women's employment rates directly impacts the number of women receiving

survivors' pension. Lower employment rates result in shorter careers at the time of retirement. Due to shorter careers and consequent lower women's own pensions, the proportion of women who opt for swapping their own pensions for the survivors' pensions has been changing, which is evident from Graph 17. The share of retired women who will receive old-age pensions will be by 3.6 percentage points lower than the base scenario if constant activity, employment and unemployment rates are assumed. Just the opposite, the share of retired women with full survivors' pensions will increase.

Graph 17: Share of retired women who receive old-age or survivors' pensions in the base scenario and in the scenario with constant activity, unemployment and employment rates

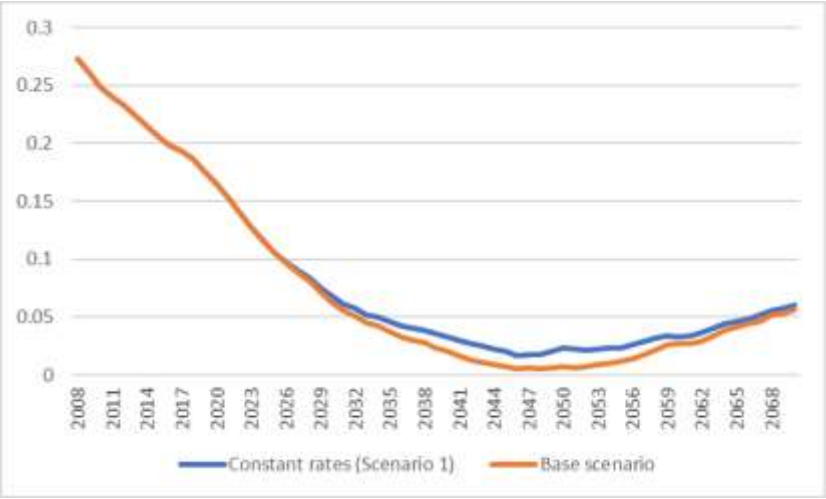


Source: DYPENSI projections.

The impact of changes in the labour market behaviour on the relationship between different pension types is the reason why, from now on, we present the GPG based on all pensions (old-age, disability and survivors') for pensioners aged 65 and over.

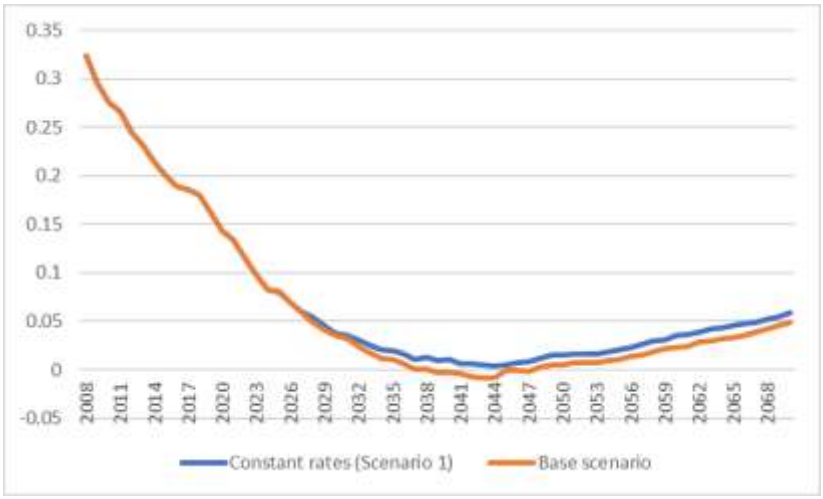
It is evident from Graph 18 and Graph 19 that keeping activity, employment and unemployment rates at their 2021 levels through the entire simulation period leads to higher GPGs at mean and at the 25th percentile. The increasing activity and employment rates (especially for age groups 60 and over), as assumed in the base scenario (based on the AWG 2021 projections), obviously contribute to a decrease in GPGs in the future. If the activity and employment rates for women (and men) aged 60 and over do not increase like in the base scenario, the GPG is higher.

Graph 18: Scenario 1 – Impact of constant activity and unemployment rates on the GPG for pensioners aged 65+, at the mean



Source: DYPENSI projections.

Graph 19: Scenario 1 – Impact of constant activity and unemployment rates on the GPG for pensioners aged 65+, at the 25th percentile



Source: DYPENSI projections.

6.2. Scenario 2: Equalising the gender aspect of prospective labour market behaviour

In the equalised scenario, the key socio-economic variables have equal values for women and men: 1) the activity, unemployment and employment rates by age group, and 2) the disability rates. We do not assume equal women's and men's activity and unemployment rates, but we instead set the activity, unemployment and disability rates at the average level for women and men, by age groups. This incorporates the notion that women and men should approach each other in their behaviour. Besides, the overall rates by age group do not change relative to those in the base scenario.

In the second variant of the equalised scenario, we add equalised daily salaries[22] by age groups to the already equalised activity, unemployment and disability rates. The average daily salaries of men and women are equalised in the following way. Suppose that R_{ig} represents the unadjusted daily salary of individual i and gender g, that M_g is the unadjusted average daily salary for gender g (g = f, m), and that M is the joint average hourly salary of men and women together. Following the adjustment for 'equalisation', the average hourly salary of men and women together (M) becomes the average daily salary for both men and women. Then the 'equalised' hourly salary of individual i is $R'_{ig} = R_{ig} * (M / M_g)$. The salary equalisation is performed by five-year age groups. The advantage of the described procedure is that not only the overall daily salary remains unchanged by the correction, but also the mean salary and thus the total of salaries in the economy (Dekkers and Van den Bosch, 2020).

DYPENSI is a continuous-time model in which the salaries are calculated simultaneously during the simulation and not only at certain points of time.[23] The alignment is needed to achieve equal salaries. Therefore, the alignment to the target salaries is performed once a year, namely at the end of each year, after all other procedures are completed and the time moves to a new calendar year. At the same time, the working histories are "corrected" and aligned salaries stored to be used for the pension assessment base calculation in the future.

In the Slovenian pension system, the old-age pension[24] at retirement is the function of the working career length and salaries received throughout the career. It is calculated as the product of the accrual rate and the pension assessment base. The career length almost directly determines the accrual rate (there is also an extra 1.36% accrual rate per child taken care of in his/her first year), while salaries from the best 24 consecutive years make the pension assessment base. Equal activity, employment, unemployment and disability rates of women and men therefore affect the first term of the pension equation, while equal salaries affect its second term. The characteristics of the scenario with equal labour market behaviour (equal activity, employment and unemployment rates, disability rates and equal salaries) have an impact only on the prospective labour market behaviour. The previous labour market behaviour of currently active people can be thus expected to affect the prospective GPG in the middle-long term, while the prospective labour market behaviour will affect the GPG in the long term.

6.2.1. Scenario 2a: Equalising the activity, employment and unemployment rates of men and women

To equalise the gender aspect of prospective labour market behaviour, we make the alignment tables gender neutral. We try to answer the following question: How do the simulation results change if men and women have the same probability of being employed, unemployed, inactive or disabled? However, salaries and salary equations are not adapted, so that the existing salary differentials of men and women are preserved.

The resulting GPGs are presented in Graph 20. The GPG almost vanishes if we assume a gender-neutral behaviour on the labour market. By around 2045, the GPG will decrease to less than 0.5% and will then

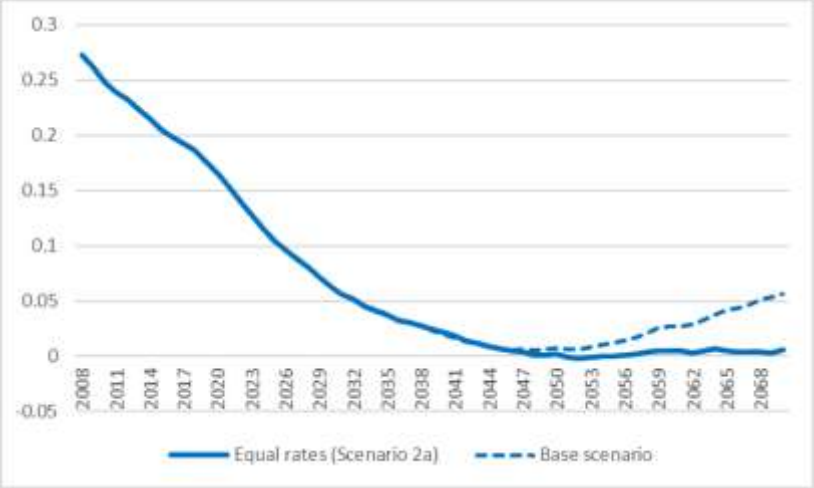
[22] In the current version of DYPENSI, we do not simulate hours of work, but days of work.

[23] The same is true for the labour market transitions, which has already been discussed in the previous section.

[24] It also holds for the survivors' and the disability pension, although these are derivatives of old-age pensions and some additional factors impact their amount.

remain at around zero in the scenario with equal activity, employment unemployment and disability rates. Surprisingly, eliminating labour market disparities seems to be enough to eliminate the GPG as well, even if the gender pay gap persists. An extra accrual rate for taking care of the child in his/her first year (1.36% per child), mostly used by women, obviously increases the average pension of women to the level of the men's average pension despite the gender pay gap. We could also conclude that, as far as pensions are concerned, extra accrual rates almost completely compensate for the impact of salary inequalities during the active years.

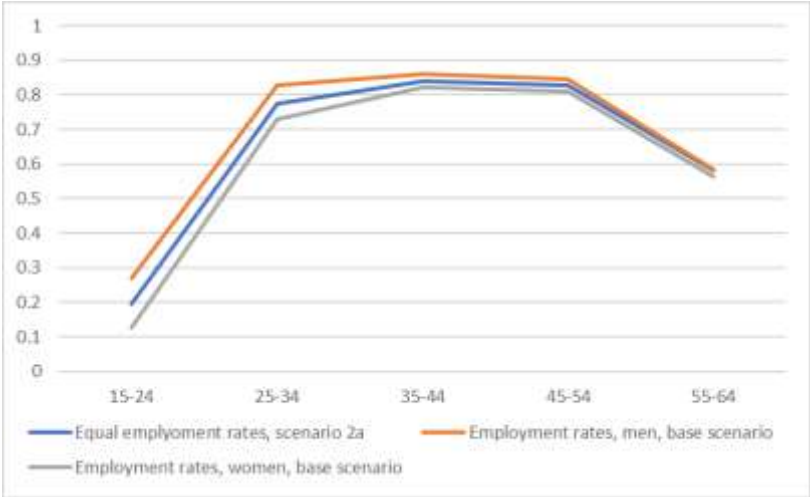
Graph 20: Scenario 2a – Impact of gender-neutral activity, employment, unemployment and disability rates on the GPG for pensioners aged 65+, at the mean



Source: DYPENSI projections.

Compared with the base scenario, the GPG is lower in the scenario with equal activity, employment, unemployment and disability rates because very important reasons for GPG are eliminated. This leads to the conclusion that equal activity, employment, unemployment and disability rates prevent a substantial rise in the GPG from 2047 onwards, which occurs in the base scenario. However, even if we equalise activity, unemployment and disability rates already in 2021, the GPG in the scenario with equal activity, employment, unemployment and disability rates differs from the GPG in the base scenario only in 2047 (Graph 20). As already mentioned, changed labour market behaviour becomes visible only after affected women (and men) will have reached retirement. This implies that the effect of changing women's labour market behaviour will become apparent in the simulation results only in the long run. This is especially true because, in the equal labour market scenario, substantially higher women's employment rates in the younger age groups are assumed than in the base scenario, which is evident from Graph 21. The effect of considerably higher employment rates for women in the age groups bellow 35 become evident when these young women retire; i.e., almost 30 years after the first change in employment rates.

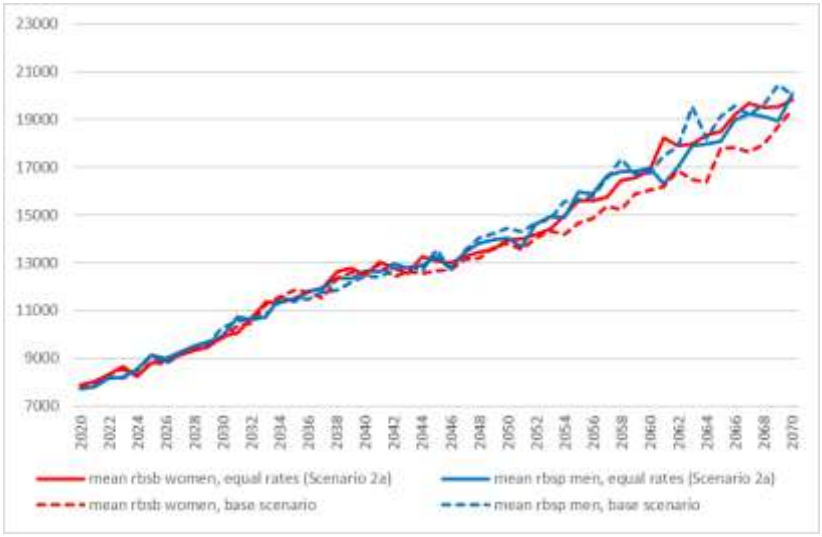
Graph 21: Employment rates for men and women in base scenario and Scenario 2a, 2060



Source: DYPENSI projections.

Graph 22 compares the average pension at retirement for men and women in the base scenario with those in Scenario 2a (equal activity, employment, unemployment and disability rates).

Graph 22: Scenario 2a – Impact of gender-neutral activity, employment, unemployment and disability rates on average pensions at retirement, by gender (€; constant prices)

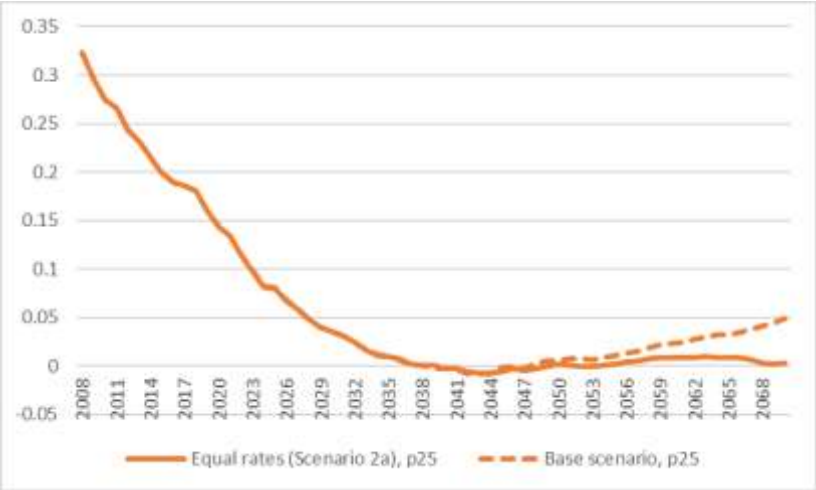


Source: DYPENSI projections.

The average men's pension is lower in the equal activity, employment and unemployment rates scenario than in the base scenario because assumed men's employment rates in the Scenario 2a are lower. If, however, equal activity, employment, unemployment and disability rates are assumed, women, on average, receive higher pensions in the scenario with equal activity, employment, unemployment and disability rates than in the base scenario. This is not surprising, as the Scenario 2a assumes higher employment rates for women than the base scenario, resulting in higher accrual rates and higher pensions at retirement. It is also evident that the difference between average pensions in the base scenario and the Scenario 2a is bigger for women than men, meaning that, due to the equalisation of activity, employment, unemployment and disability rates, the women gain more than the men lose.

Similarly, equalising women's labour market probabilities to those of men reduces the GPG, which also holds for the GPG based on the 25th percentile (Graph 23).

Graph 23: Scenario 2a – Impact of gender-neutral activity, employment and unemployment rates on the GPG for old-age pensioners aged 65+, at the 25th percentile

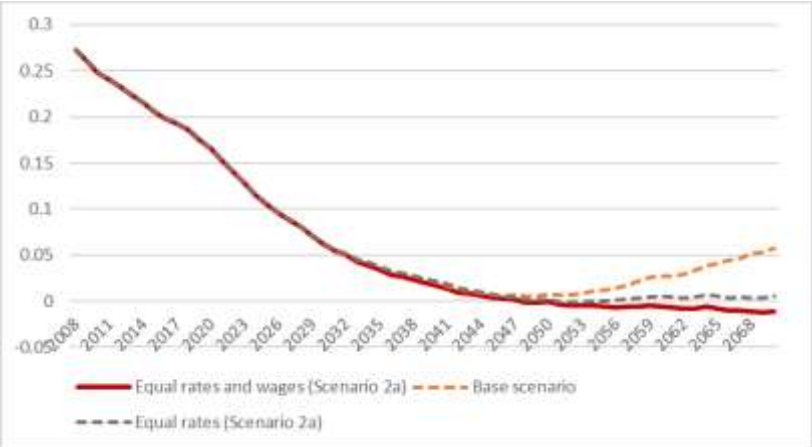


Source: DYPENSI projections.

6.2.2. Scenario 2b: Equalising average daily salaries of men and women

In the previous subsection, the prospective labour market behaviour of women was adapted to equal that of men. This clearly affects the projected pensions in the long run and lowers the GPG. In Scenario 2b, daily salaries of women and men, by age groups, were equalised on top of equalised activity, employment, unemployment and disability rates in the Scenario 2a. This means that the labour market behaviour and salaries are the same for women and men from 2021 on and that almost all elements causing GPG are eliminated. As women and men (by age groups) earn equal salaries, their pension assessment bases will eventually become equal as well, which will lead to the equality of two major terms in the pension equation. The results in Graph 24 answer the question regarding the change in simulation results if men and women have the same probability of being employed, unemployed, inactive or disabled, and earn the same daily salaries.

Graph 24: Scenario 2b – Impact of gender-neutral activity, employment, unemployment and disability rates and the average daily salary on the GPG for pensioners aged 65+, at the mean



Source: DYPENSI projections.

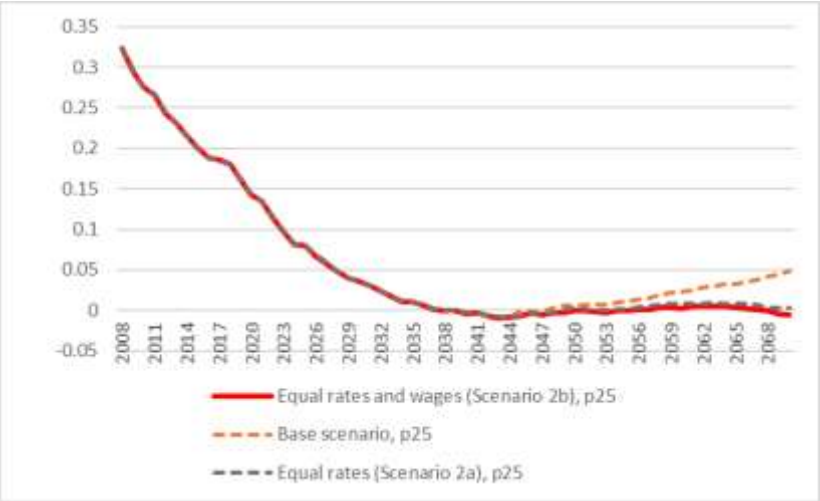
Equalising daily salaries of men and women on top of their equal activity, employment, unemployment and disability rates (Scenario 2b) lowers the GPG substantially compared to the base scenario. Moreover, if equal activity, employment, unemployment and disability rates and salaries are assumed, the GPG becomes negative in 2048, meaning that women, on average, will receive higher pensions than men. The GPG remains negative until 2070 and amounts to between -0.2% and -1.3 %. The negative GPG is the consequence of an additional accrual rate for caring for children in their first year, to which mainly women are eligible. Given the equal career lengths and equal pension bases, extra accrual rates increase pensions of women above those of men.

In the scenario with equal labour market behaviour and salaries of women and men (Scenario 2b), the GPGs differ from those in the base scenario already from 2021 onwards – just after the salaries and the labour market behaviour are equalised. However, the difference between the two scenarios remains at less than 1 pp until 2051. Obviously, setting the salaries equal impacts the GPG sooner than the labour market equalisation. The comparison of Scenarios 2a and 2b shows that the equal labour market behaviour has a greater impact on the drop in GPG than equal salaries. For example, if equal activity, unemployment and disability rates are assumed, the GPG decreases by 2.2 pp in 2060, while it drops by additional 1.1 pp when equal salaries are assumed.

The same conclusions can be drawn concerning the GPG at the 25th percentile, as the GPG is lower in the Scenario 2b than in the base scenario even at the lower part of the income distribution (Graph 25). Interestingly, compared with the scenario with equal labour market behaviour (Scenario 2a), equalising salaries (in Scenario 2b) only slightly lowers the GPG. Obviously, at the 25th percentile, the pension assessment base is still equal to the minimum pension base in both the base scenario and the Scenario 2a.[25]

[25] The pension assessment base is calculated from the salaries earned in 24 consecutive best years and has both the floor and the ceiling.

Graph 25: Scenario 2b – Impact of gender-neutral activity, employment, unemployment and disability rates, and of average daily salary, on the GPG for pensioners aged 65+, at the 25th percentile



Source: DYPENSI projections.

6.3. Scenario 3: Pension legislation from 2019 on

Until 2019, women were eligible for higher accrual rates than men for the same pension contribution period, which was justified by different retirement conditions for women and men (women could retire with shorter careers). However, the retirement conditions became equal for women and men in 2020, which eliminated the argument for different accrual rates. In 2019, the pension of a man with a 40-year pension contribution period amounted to 57.25% of his pension assessment base, while that of a woman with an equally long pension contribution period amounted to 63.5% of her pension assessment base. The accrual rates will be gradually increasing in 2020–2024 and will ultimately be the same for women and men in 2025: 29.5% for the first 15 years of work (or 1.97% per year) and 1.36% for each additional year of work. There is also an additional accrual rate of 1.36% for taking care of each child in his/her first year (for a maximum of three children). Table 2 presents accrual rates for a 40-year pension contribution period.

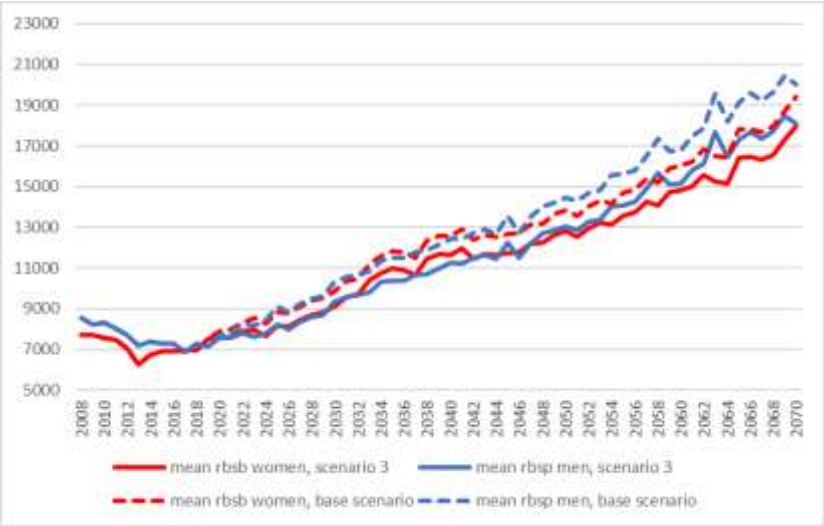
Table 2: Accrual rates for a 40-year pension contribution period under the legislations in force in 2019 and in 2020

Year	Legislation in force in 2019		Legislation in force in 2020	
	Men	Women	Men	Women
2019	57.25	63.5	57.25	63.5
2020	57.25	61.5	58.5	63.5
2021	57.25	61.5	59.5	63.5
2022	57.25	61.5	60.5	63.5
2023	57.25	60.25	61.5	63.5
2024	57.25	60.25	62.5	63.5
2025	57.25	60.25	63.5	63.5

The pension legislation revisions have increased the accrual rates (and consequent pensions) for both men and women from 2020 on but, due to higher accrual rates, women receive higher pensions than men with equal characteristics until 2024. With the accrual rates becoming gender neutral in 2025, the difference in calculation of men's and women's pensions disappears. An extra accrual rate for taking

care of children in their first year[26] will not be able to compensate the "lost" difference in accrual rates, which existed in the 2019 legislation. Average pension amounts at retirement are shown in Graph 26.

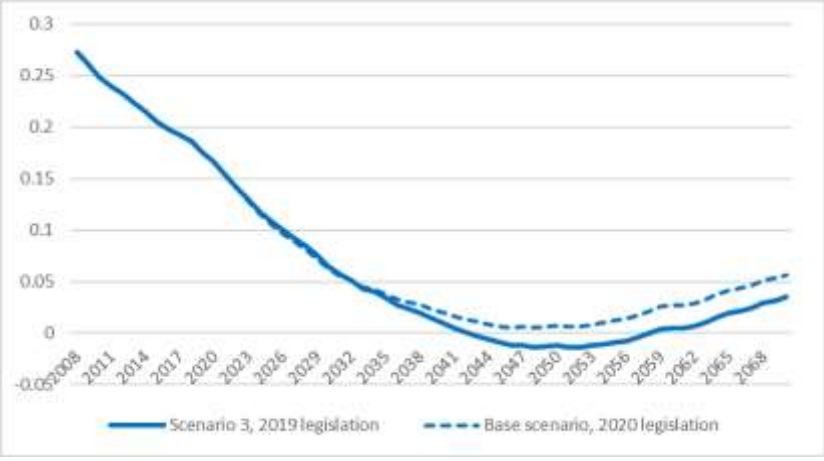
Graph 26: Scenario 3 – Average pensions at retirement in the base scenario and the scenario based on the 2019 legislation (Scenario 3), by gender (€; constant prices)



Source: DYPENSI projections.

Scenario 3 differs from the base scenario only in accrual rates taken into account (according to the pension legislation from 2019 and 2020, respectively), while the labour market behaviour and salaries correspond to those in the base scenario. This scenario answers the question of how big the GPG would be if the pension legislation had not changed in 2020. The results are presented in Graph 27.

Graph 27: Scenario 3 – Impact of legislation changes on the GPG for pensioners aged 65+, at the mean



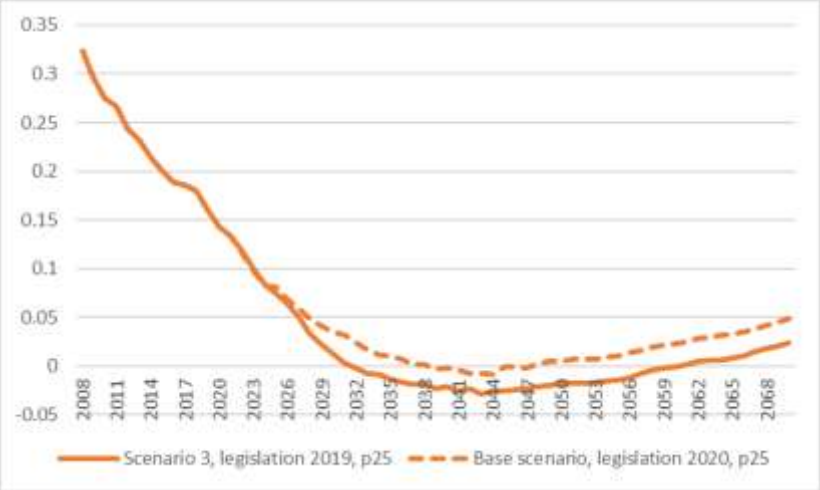
Source: DYPENSI projections.

If the 2019 pension legislation remained in force, the GPG would be much lower than in the base scenario. Higher accrual rates for women than men would even cause the GPG to become negative in 2043 in Scenario 3. In 2059, the GPG would become positive again and would reach 3.5% in 2070. The GPG would start increasing around 2050, driven only by a shorter women's pension contribution period

[26] In simulation, only women get additional accrual rates for taking care of children.

compared to men. Around 2050, the number of retired persons from the cohorts characterized by wider gender gaps in employment rates for younger age groups is already substantial. Women with shorter completed pension contribution periods receive, on average, lower pensions than men, which leads to the GPG increase. After 2050, the GPG is around 2 pp lower in Scenario 3 than in the base scenario. The same holds for pensions at the 25th percentile (Graph 28).

Graph 28: Scenario 3 – Impact of legislation changes on the GPG for pensioners aged 65+at the 25th percentile



Source: DYPENSI projections.

7. Conclusions

The GPG reflects the size of a lag of women's pensions behind those of men. This note describes projections of the future gender pension gap using the Slovenian dynamic microsimulation model DYPENSI, and attempts to identify the underlying developments that cause the obtained results. Results for the standard GPG, as defined by Eurostat, are presented, and several variant GPGs. In the base scenario, the employment and salary growths follow the trends projected by the AWG, while we change these assumptions in variant scenarios. Finally, we show hypothetical GPGs based on the no longer valid 2019 legislation that had different rules for calculating men's and women's pensions.

In the base scenario, the standard GPG for the total statutory pension (old-age, survivor's and disability pension) declines until around 2050 when it amounts to only 0.7%. It then increases and reaches 5.7% in 2070. The results also show a significant difference in GPG between younger (65-74) and older (75+) pensioners, as the GPG increases substantially with higher age. There are three crucial reasons for age-related differences in GPG: a) a higher share of survivors' pensions among women in older age groups, b) the possibility for women pensioners from older age groups to retire with shorter careers and lower pensions, and c) lower educational attainment of women from the older age bracket in comparison with men, which led to women's lower salaries and lower pensions. The difference in the GPGs between age groups is slowly narrowing until 2050. Still, from 2060 onwards, the simulation results show a reversed trend: the GPG is higher among younger pensioners than those aged 75 years and over.

Currently, the GPG at retirement is even negative, as women are still eligible for higher accrual rates than men with the same length of the pension contribution period. Taking into account that women in Slovenia mostly work full-time, that the gender pay gap is lower than in the EU on average, and that men and women retire with similar numbers of working years, higher pensions at retirement for women (compared with men) are not very surprising. Pension calculation rules will become gender neutral in 2025 when also the GPG at retirement will become positive. Besides the change in the pension legislation towards gender-neutral pension rules, the lower women's employment rates in younger age groups, compared to men's, drive the GPG increase after 2050. Birth cohorts of women aged 45 and over did not experience a gender gap in employment rates and therefore retire with completed pension contribution periods very similar to those of men from the same birth cohort. On the contrary, women's younger birth cohorts are affected by gender gaps in employment rates at their young age and thus complete shorter pension contribution periods and receive lower pensions than men.

GPGs at the 25th percentile are lower than those based on means and, in the late 2040s, come very close to zero. This indicates that, in the lower part of the income distribution, the difference between men's and women's pensions is smaller than at the mean. On the other hand, the GPGs at the 10th percentile are higher than the GPGs based on means, which means that more women than men receive very low pensions and that inequality at the lower end of the income distribution is higher for women than for men.

In Slovenia, pension coverage is slightly lower for women than for men. When zero pension values are included in the GPG calculation, the GPG is around 20% higher than without them around 2020. As the proportion of older people without pensions decreases, the GPG including zero pensions starts to

converge with the standard GPG around the late 2040s, and ends up around one percentage point higher at the simulation horizon.

The analysis shows that the survivors' pensions contribute to a higher GPG. The survivors' pensions are on average lower than the old-age and disability pensions. Including them in the GPG calculation decreases the average pension of women who much more frequently than men receive full survivors' pensions. This holds for the GPGs at the mean, but even more so for the GPGs at the 25th percentile. The impact of the survivors' pensions on the GPG is expected to decrease over time as the share of survivors' pensions recipients decreases.

This note also examines how much the labour market and salary differentials contribute to GPG if some parts of the model are blocked or adapted. We emphasise that these simulations are only carried out for analytical purposes and do not represent realistic or desirable developments or policy options.

Keeping activity, employment and unemployment rates by gender and age category at their 2021 levels for the total simulation period leads to higher GPGs at mean and at the 25th percentile compared with the base scenario. Obviously, the increasing activity and employment rates (especially for age groups 60 and over), as assumed in the base scenario, contribute to a decreasing GPGs in the future.

A gradual equalisation of the gender aspect of the prospective labour market behaviour (activity, unemployment, employment and disability rates), by age group, diminishes the GPG, even if the gender pay gap is preserved. We could also conclude that, as far as pensions are concerned, extra accrual rates for taking care of the child in his/her first year (1.36% per child), mainly used by women, completely compensate for the gender pay gap during the active years. Adding equal pay for men and women to the equal labour market behaviour brings the GPG to a negative value, meaning that women have on average higher pensions than men.

Until 2019, women were eligible for higher accrual rates than men for the same pension contribution period, which was justified by different retirement conditions for women and men (women could retire with shorter careers). Equal accrual rates for women and men since 2025 affect the simulated GPGs values. Therefore, we try to show how much smaller the GPG would be if the different accrual rates for men and women remained in force. The results show that the GPG is lower, and even negative in 2043-2058, if the "old" legislation is assumed.

References

Bartolj, T., Kalar, B, and Kump, N. (2020) *Analysis of causes for the gender pension gap in the Republic of Slovenia*. Ljubljana: Ministry of Labour, Family, Social Affairs and Equal Opportunities. Available at: https://pokojnina.enakostspolov.si/slo/wp-content/uploads/2020/12/MDMP-Analysis-of-causes-for-the-gender-pension-gap-in-the-Republic-of-Slovenia.pdf [21/12/2020].

Dekkers, G., and Van den Bosch, K. (2021) Project MIGAPE: Work Package 3: Projections of the Gender Pension Gap in Belgium using MIDAS. Brussels: Federal Planning Bureau.

Dekkers, G., Hoorens, V., and Van den Bosch, K. (2019) 'Project text "Mind the Gap"'. Available at: http://www.migape.eu/pubs/Migape%20project%20details%20and%20description.pdf [15/012021].

Dekkers, G., and Van den Bosch, K. (2020) 'MIGAPE, WP3: Guidelines.

European Commission (2018) *The 2018 Pension Adequacy Report: current and future income adequacy in old age in the EU, Country profiles, Volume II*. Brussels: European Commission, pp. 228–231. https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8085&furtherPubs=yes [09 /02/2021]

European Commission (2020) *The 2021 Ageing Report: Underlying Assumptions and Projection Methodologies*. Brussels: European Commission. Available at: https://ec.europa.eu/info/sites/info/files/economy-finance/ip142_en.pdf [13/01/2021].

Kump, N., Kalar, B., Majcen, B., and Čok, M. (2020) *EUROMOD Country report, Slovenia (SI), 2017-2020*. Available at: https://euromod-web.jrc.ec.europa.eu/sites/default/files/2020-12/Y11_CR_SI_Final.pdf [9/02/2021]

Kump, N., and Stropnik, N. (2020) *Results of the standard simulations for Slovenia: Project MIGAPE (Mind the Gap in Pensions), Work Package 2*. Ljubljana: Institute for Economic Research. Available at: http://www.migape.eu/pubs/WP2_SIE_Report_20200422.pdf [15/01/2021).

Kump, N., Majcen, B., Sambt, J., Lotrič Dolinar, A., Spielauer, M., Verbič, M., Spruk, R (2017). *Dinamični mikrosimulacijski pokojninski model – DYPENSI [Dynamic Microsimulation pension model – DYPENSI]*. Ljubljana: Institute for Economic Research.

MIGAPE website (2021) 'MIGAPE − Mind the Gap in Pensions. A research project on Gender Pension Gaps'. Available from: http://www.migape.eu/ [15/01/2021].

PDIIS (2020) *Letno poročilo 2019 [2019 Annual report]*. Ljubljana: Pension and Disability Insurance Institute of Slovenia. Available at: https://www.zpiz.si/content2019/2letna-poroila019 [15/01/2021].

ZPIZ (1992) Pension and Disability Insurance Act [Zakon o pokojninskem in invalidskem zavarovanju], *Official Gazette of the Republic of Slovenia*, No 12/1992. Available at: http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO200 [09/02/2021]

ZPIZ-1 (1999) Pension and Disability Insurance Act [Zakon o pokojninskem in invalidskem zavarovanju, *Official Gazette of the Republic of Slovenia*, No 106/1999. Available at: http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1431 [09/02/2021]

ZPIZ-2 (2012) Pension and Disability Insurance Act [Zakon o pokojninskem in invalidskem zavarovanju, *Official Gazette of the Republic of Slovenia*, No 96/2012. Available at: http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO6280 [09/02/2021]

ZPIZ-2G (2019) Act Amending the Pension and Disability Insurance Act [Zakon o spremembi in dopolnitvah Zakona o pokojninskem in invalidskem zavarovanju], Official Gazette of the Republic of Slovenia, No 75/2019. Available at: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina?urlurid=20193306 (15/8/2020)

ZPIZ-2H (2020) Act Amending the Pension and Disability Insurance Act [Zakon o spremembi in dopolnitvah Zakona o pokojninskem in invalidskem zavarovanju], *Official Gazette of the Republic of Slovenia*, No 139/2020. Available at: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2020-01-2448/ [09 /02/2021]

Annex: Additional tables

Base scenario

Table A1: Projected indicators of the average GPG, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.063	0.020	0.007	0.027	0.057
65-74 with pension	0.106	-0.020	-0.010	-0.009	0.063	0.073
75+ with pension	0.224	0.137	0.030	0.008	0.000	0.041
At retirement	-0.023	0.046	-0.011	0.042	0.042	0.030
All pensioners	0.132	0.059	0.020	0.012	0.030	0.061
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.082	0.027	0.010	0.036	0.066
65-74	0.142	-0.011	-0.013	0.001	0.083	0.086
75+	0.259	0.161	0.043	0.010	0.003	0.045
At SRA	0.077	-0.009	-0.070	0.064	0.105	0.068
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.046	0.007	-0.002	0.017	0.048
65-74 with pension	0.094	-0.035	-0.017	-0.018	0.049	0.068
75+ with pension	0.218	0.126	0.015	-0.002	-0.008	0.030
At retirement	-0.059	0.047	-0.024	0.024	0.040	0.023
All pensioners	0.112	0.042	0.006	0.001	0.020	0.051
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.052	0.013	0.004	0.023	0.055
65-74 with pension	0.102	-0.029	-0.011	-0.014	0.059	0.074
75+ with pension	0.186	0.084	-0.025	-0.032	-0.034	0.007
At retirement	-0.049	0.067	-0.017	0.036	0.023	0.026
All pensioners	0.127	0.049	0.014	0.009	0.028	0.060

Table A2: GPG at various percentiles of the pension distribution, using the standard definition of the GPG (retirement and survivor pensions, no zero pensions; for 65+)

	2020	**2030**	**2040**	**2050**	**2060**	**2070**
p10	0.231	0.105	0.030	0.029	0.065	0.109
p25	0.143	0.036	-0.002	0.005	0.023	0.049
p50 (median)	0.166	0.058	0.014	0.001	0.019	0.051
p75	0.136	0.030	-0.011	-0.032	-0.007	0.039
p90	0.185	0.073	0.024	0.018	0.046	0.067

Table A3: Auxiliary information

	2020	2030	2040	2050	2060	2070
Average length of career at retirement						
Women	37.7	37.0	34.5	33.6	33.3	33.7
Men	38.3	37.2	35.8	34.6	35.8	36.4
Average pension base at retirement						
Women	1,048	1,280	1,731	1,966	2,293	2,783
Men	1,110	1,376	1,722	2,045	2,350	2,779
Percentage of pensioners with old-age pension						
Women	71.4	79.0	82.4	83.8	84.2	83.5
Men	75.3	76.7	76.9	78.0	79.2	80.5
Percentage of pensioners with disability pension						
Women	12.0	10.3	9.9	9.6	9.7	10.3
Men	22.5	20.7	20.2	19.2	17.9	16.6
Percentage of pensioners with full survivors' pension from spouse						
Women	16.5	10.6	7.8	6.5	6.2	6.2
Men	2.2	2.6	2.9	2.8	2.9	2.9
Average age of pensioners						
Women	73.3	74.7	76.7	78.0	78.9	79.4
Men	70.5	72.2	74.0	75.3	76.3	77.2

Scenario 1: Constant activity and unemployment rates from 2021 on

Table A1: Projected indicators of the average GPG, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.067	0.033	0.023	0.033	0.060
65-74 with pension	0.106	-0.010	0.013	0.013	0.051	0.081
75+ with pension	0.224	0.137	0.035	0.022	0.018	0.042
At retirement	-0.023	0.066	-0.070	0.082	0.051	0.069
All pensioners	0.132	0.064	0.033	0.030	0.041	0.065
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.087	0.048	0.038	0.054	0.088
65-74	0.142	0.000	0.027	0.038	0.087	0.128
75+	0.259	0.161	0.051	0.035	0.032	0.057
At SRA	0.077	0.011	-0.014	0.106	0.093	0.171
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.048	0.014	0.003	0.011	0.040
65-74 with pension	0.094	-0.031	-0.004	-0.013	0.027	0.067
75+ with pension	0.218	0.127	0.017	0.005	-0.004	0.018
At retirement	-0.059	0.055	-0.101	0.048	0.043	0.065
All pensioners	0.112	0.044	0.013	0.007	0.018	0.044
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.055	0.026	0.013	0.017	0.042
65-74 with pension	0.102	-0.024	0.011	-0.007	0.029	0.067
75+ with pension	0.186	0.084	-0.022	-0.023	-0.027	-0.002
At retirement	-0.049	0.078	-0.097	0.055	0.038	0.072
All pensioners	0.127	0.054	0.025	0.018	0.024	0.047

Table A2: GPG at various percentiles of the pension distribution, using the standard definition of the GPG (retirement and survivor pensions, no zero pensions; for 65+)

	2020	2030	2040	2050	2060	2070
p10	0.231	0.111	0.046	0.055	0.087	0.110
p25	0.143	0.037	0.010	0.015	0.035	0.059
p50 (median)	0.166	0.061	0.021	0.015	0.025	0.043
p75	0.136	0.032	0.002	-0.010	0.007	0.044
p90	0.185	0.080	0.047	0.030	0.049	0.080

Table A3: Auxiliary information

	2020	2030	2040	2050	2060	2070
Average length of career at retirement						
Women	37.7	36.8	33.9	32.8	32.1	32.7
Men	38.3	37.2	35.1	34.4	35.0	35.4
Average pension base at retirement						
Women	1,048	1,265	1,792	2,003	2,319	2,794
Men	1,110	1,364	1,668	2,072	2,344	2,888
Percentage of pensioners with old-age pension						
Women	71.4	78.2	80.4	80.7	80.6	80.1
Men	75.3	76.8	76.7	77.5	79.0	80.4
Percentage of pensioners with disability pension						
Women	12.0	10.6	10.1	10.0	9.9	10.3
Men	22.5	20.6	20.2	19.1	17.2	15.7
Percentage of pensioners with full survivors' pension from spouse						
Women	16.5	11.3	9.5	9.3	9.5	9.5
Men	2.2	2.6	3.1	3.4	3.9	3.9
Average age of pensioners						
Women	73.3	74.6	76.7	78.0	78.8	79.3
Men	70.5	72.2	74.1	75.4	76.3	77.3

Scenario 2a: Equalising the activity, employment and unemployment rates of men and women

Table A1: Projected indicators of the average GPG, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.063	0.021	0.002	0.005	0.006
65-74 with pension	0.106	-0.019	-0.010	-0.022	0.020	-0.018
75+ with pension	0.224	0.137	0.031	0.009	-0.010	0.011
At retirement	-0.023	0.002	0.016	0.005	0.006	0.013
All pensioners	0.132	0.057	0.020	0.008	0.009	0.004
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.082	0.027	0.002	0.009	-0.002
65-74	0.142	-0.011	-0.014	-0.014	0.039	-0.023
75+	0.259	0.161	0.042	0.007	-0.014	0.000
At SRA	0.077	-0.011	-0.065	0.052	0.039	0.034
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.046	0.009	-0.006	-0.002	-0.001
65-74 with pension	0.094	-0.034	-0.015	-0.027	0.011	-0.021
75+ with pension	0.218	0.127	0.017	0.000	-0.016	0.003
At retirement	-0.059	0.009	0.004	0.000	-0.004	0.007
All pensioners	0.112	0.040	0.008	0.000	0.002	-0.003
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.056	0.018	-0.002	-0.001	-0.002
65-74 with pension	0.102	-0.023	-0.012	-0.029	0.006	-0.020
75+ with pension	0.186	0.084	-0.021	-0.032	-0.043	-0.023
At retirement	-0.049	0.010	-0.019	-0.012	0.004	0.017
All pensioners	0.127	0.051	0.017	0.002	0.002	-0.004

Table A2: GPG at various percentiles of the pension distribution, using the standard definition of the GPG (retirement and survivor pensions, no zero pensions; for 65+)

	2020	**2030**	**2040**	**2050**	**2060**	**2070**
p10	0.231	0.104	0.024	0.012	0.022	0.023
p25	0.143	0.035	-0.003	0.003	0.009	0.003
p50 (median)	0.166	0.058	0.014	-0.006	-0.009	-0.007
p75	0.136	0.026	-0.012	-0.040	-0.025	-0.015
p90	0.185	0.072	0.025	-0.002	0.015	0.025

Table A3: Auxiliary information

	2020	2030	2040	2050	2060	2070
Average length of career at retirement						
Women	37.7	36.8	34.5	33.8	34.3	35.2
Men	38.3	37.0	36.3	34.6	35.6	35.2
Average pension base at retirement						
Women	1,048	1,291	1,711	1,982	2,362	2,753
Men	1,110	1,331	1,755	1,982	2,393	2,856
Percentage of pensioners with old-age pension						
Women	71.4	77.5	79.4	80.4	80.8	81.3
Men	75.3	78.7	80.5	82.0	83.1	83.5
Percentage of pensioners with disability pension						
Women	12.0	12.1	13.2	13.6	13.8	13.5
Men	22.5	18.6	16.6	15.2	13.9	13.2
Percentage of pensioners with full survivors' pension from spouse						
Women	16.5	10.4	7.4	6.0	5.4	5.2
Men	2.2	2.7	2.9	2.8	3.0	3.3
Average age of pensioners						
Women	73.3	74.5	76.4	77.9	78.7	79.0
Men	70.5	72.5	74.3	75.5	76.6	77.5

Scenario 2b: Equalising average daily salaries of men and women

Table A1: Projected indicators of the average GPG, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.062	0.017	0.000	-0.006	-0.011
65-74 with pension	0.106	-0.022	-0.017	-0.019	-0.008	-0.042
75+ with pension	0.224	0.137	0.029	0.003	-0.011	-0.002
At retirement	-0.023	-0.007	0.016	-0.009	-0.021	-0.029
All pensioners	0.132	0.055	0.015	0.005	-0.002	-0.015
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.080	0.022	0.000	-0.002	-0.019
65-74	0.142	-0.014	-0.021	-0.011	0.012	-0.046
75+	0.259	0.161	0.041	0.001	-0.016	-0.014
At SRA	0.077	-0.017	-0.070	0.045	0.013	-0.003
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.045	0.004	-0.008	-0.014	-0.019
65-74 with pension	0.094	-0.036	-0.023	-0.024	-0.018	-0.045
75+ with pension	0.218	0.127	0.015	-0.006	-0.018	-0.012
At retirement	-0.059	-0.001	0.004	-0.017	-0.031	-0.038
All pensioners	0.112	0.038	0.003	-0.004	-0.010	-0.023
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.054	0.013	-0.004	-0.013	-0.020
65-74 with pension	0.102	-0.027	-0.020	-0.026	-0.022	-0.044
75+ with pension	0.186	0.084	-0.023	-0.038	-0.044	-0.038
At retirement	-0.049	0.000	-0.018	-0.025	-0.022	-0.026
All pensioners	0.127	0.049	0.012	0.000	-0.010	-0.023

Table A2: GPG at various percentiles of the pension distribution, using the standard definition of the GPG (retirement and survivor pensions, no zero pensions; for 65+)

	2020	2030	2040	2050	2060	2070
p10	0.166	0.057	0.011	-0.007	-0.022	-0.035
p25	0.231	0.103	0.024	0.011	0.016	0.018
p50 (median)	0.143	0.035	-0.004	-0.001	0.002	-0.005
p75	0.136	0.025	-0.014	-0.041	-0.040	-0.044
p90	0.185	0.070	0.017	-0.006	0.001	0.005

Table A3: Auxiliary information

	2020	2030	2040	2050	2060	2070
Average length of career at retirement						
Women	37.7	36.8	34.5	33.8	34.3	35.2
Men	38.3	37.0	36.3	34.6	35.6	35.2
Average pension base at retirement						
Women	1,048	1,295	1,704	1,991	2,405	2,839
Men	1,110	1,323	1,745	1,961	2,369	2,817
Percentage of pensioners with old-age pension						
Women	71.4	77.5	79.4	80.4	80.8	81.3
Men	75.3	78.7	80.4	82.0	83.0	83.5
Percentage of pensioners with disability pension						
Women	12.0	12.1	13.2	13.6	13.8	13.5
Men	22.5	18.6	16.6	15.2	13.9	13.2
Percentage of pensioners with full survivors' pension from spouse						
Women	16.5	10.4	7.4	6.0	5.4	5.2
Men	2.2	2.7	2.9	2.8	3.1	3.4
Average age of pensioners						
Women	73.3	74.5	76.4	77.9	78.7	79.0
Men	70.5	72.5	74.3	75.5	76.6	77.5

Scenario 3: Pension legislation from 2019 on

Table A1: Projected indicators of the average GPG, using various pension concepts and for four populations

A. Old-age pensions, disability pensions and survivors' pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.166	0.065	0.010	-0.012	0.005	0.035
65-74 with pension	0.106	-0.013	-0.029	-0.032	0.041	0.051
75+ with pension	0.224	0.137	0.032	-0.006	-0.022	0.019
At retirement	0.002	0.022	-0.034	0.017	0.021	0.008
All pensioners	0.132	0.055	0.006	-0.008	0.008	0.038
B. Old-age pensions, disability pensions and survivors' pensions, including zero values						
	2020	2030	2040	2050	2060	2070
All 65+	0.199	0.084	0.018	-0.009	0.014	0.045
65-74	0.142	-0.004	-0.032	-0.022	0.061	0.065
75+	0.259	0.161	0.046	-0.003	-0.018	0.023
At SRA	0.077	-0.018	-0.094	0.044	0.083	0.047
C. Old-age pensions and disability pensions, excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.151	0.050	-0.003	-0.023	-0.007	0.024
65-74 with pension	0.094	-0.028	-0.038	-0.043	0.025	0.046
75+ with pension	0.218	0.126	0.019	-0.017	-0.032	0.005
At retirement	-0.029	0.025	-0.048	-0.003	0.016	0.001
All pensioners	0.113	0.039	-0.008	-0.021	-0.004	0.027
D. Only old-age pensions excluding zero values						
	2020	2030	2040	2050	2060	2070
All 65+ with pensions	0.162	0.056	0.003	-0.016	0.002	0.035
65-74 with pension	0.102	-0.022	-0.031	-0.037	0.038	0.055
75+ with pension	0.186	0.084	-0.019	-0.045	-0.056	-0.015
At retirement	-0.017	0.050	-0.037	0.012	0.001	0.007
All pensioners	0.127	0.048	0.002	-0.011	0.007	0.040

Table A2: GPG at various percentiles of the pension distribution, using the standard definition of the GPG (retirement and survivor pensions, no zero pensions; for 65+)

	2020	**2030**	**2040**	**2050**	**2060**	**2070**
p10	0.231	0.096	0.024	0.015	0.043	0.085
p25	0.143	0.013	-0.021	-0.018	0.000	0.024
p50 (median)	0.166	0.064	0.008	-0.017	-0.001	0.031
p75	0.135	0.031	-0.022	-0.054	-0.029	0.019
p90	0.185	0.083	0.018	0.000	0.027	0.046

Table A3: Auxiliary information

	2020	2030	2040	2050	2060	2070
Average length of career at retirement						
Women	37.7	37.0	34.5	33.6	33.3	33.7
Men	38.3	37.2	35.8	34.6	35.8	36.4
Average pension base at retirement						
Women	1,048	1,281	1,730	1,967	2,292	2,785
Men	1,110	1,374	1,720	2,042	2,348	2,779
Percentage of pensioners with old-age pension						
Women	71.4	79.0	82.3	83.8	84.2	83.6
Men	75.3	76.7	76.8	77.9	79.1	80.4
Percentage of pensioners with disability pension						
Women	12.0	10.3	9.9	9.6	9.7	10.3
Men	22.5	20.7	20.3	19.2	17.9	16.6
Percentage of pensioners with full survivors' pension from spouse						
Women	16.5	10.7	7.8	6.6	6.2	6.1
Men	2.2	2.6	2.9	2.9	3.0	3.0
Average age of pensioners						
Women	73.3	74.7	76.7	78.0	78.9	79.4
Men	70.5	72.2	74.0	75.3	76.3	77.2